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I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

The business magazine of the farm and industrial equipment industry

NOV-DEC 1988

Industry Execs Eye 1989

page 20

In Turf Equipment Sales:

Dealers Make the Difference

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A Wall Street View of This Industry

page 27

I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

The business magazine of the farm and industrial equipment industry.

November-December 1988 • Vol. 103 • No. 13

On Our Cover

Dealer Andrew Rodgers, West Columbia, S.C., sells Case IH, Excel, Turf Vac, Cub Cadet and other professional turf care product lines.

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12: **The North American Equipment Dealers Assn.** has prepared a hazard communication standard compliance kit. This combined video cassette and factbook packet provides dealers with an excellently-illustrated video instructional tape for showing employees.

14: **Are we ready for high-yield wheat?** ICM could intensify equipment sales. Some design refinements will probably be appropriate.

14: **A stripper header has completed** its first commercial test on conventional combines, and NIAE engineers have been working on a pull-type combine specifically designed for the stripper principle. It could sell for half the price of a conventional unit.

18: **The challenge** of arresting the dealer's loss of market share in replacement parts continues. Here's a report on some findings of a recent FIEI survey of dealers.

18: **To give its members** a better picture of the world in which they will be operating, FIEI organized a convention around the theme, "Expanding the Limits: Opportunities in a Global Market."

27: **How does the farm equipment industry** look today to the watchers from the financial community? Here's what a couple of veteran watchers are saying.

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Farm Press Publications, Inc.

September U.S. Retail Sales Activity Shows Mixed Results

TRACTOR RETAIL SALES in September showed strength in some horsepower brackets and sharp declines in others. Volume stayed up among four-wheel-drive models and two-wheelers from 40 to 99 hp, but declined in other areas. The sharp drop in sales of 100-hp-plus units was partly due to the unusually large volumes generated in August of 1987 as well as the limited inventories of tractors in these sizes. Combine volume dropped considerably, largely because of drought, but sales for the nine months were about even with 1987.

UNIT RETAIL SALES

Equipment	September 1988	September 1987	% Change	January - September 1988	January - September 1987	% Change
Farm Wheel Tractors:						
2-Wheel Drive						
Under 40 HP	4,206	4,527	(7.1)	43,924	48,320	(9.1)
40 & Under 100 HP	2,425	2,282	6.3	25,022	22,288	12.3
100 & Under 140 HP	282	749	(62.3)	3,037	3,585	(15.3)
140 HP & Over	952	1,882	(49.4)	7,844	7,626	2.9
Total 2-Wheel Drive	7,865	9,440	(16.7)	79,827	81,819	(2.4)
4-Wheel Drive						
Under 200 HP	67	47	42.6	670	350	91.4
200 HP & Over	107	97	10.3	1,162	651	78.5
Total 4-Wheel Drive	174	144	20.8	1,832	1,001	83.0
Total Farm Wheel Tractors	8,039	9,584	(16.1)	81,659	82,820	(1.4)
Combines (Self-Propelled)	853	1,379	(38.1)	3,890	3,853	1.0
Balers (Bales under 200 lbs.)	421	395	6.6	4,972	4,709	5.6
Forage Harvesters (Shear Bar Type)	429	408	5.1	1,810	1,725	4.9
Mower Conditioners	883	851	3.8	9,469	9,768	(3.1)

4-Wheeler Developments: MF Returns; Case IH Consolidates

McConnell Tractors, Ltd. will manufacture a new series of articulated four-wheel-drive tractors for Massey-Ferguson dealers in 1989. To be known as the 5000 series, they will be upgraded versions of the 4000 series and will consist of two models in the 300-400 hp range.

J. Ward McConnell Jr., chairman of McConnell Tractors, said groundbreaking took place in October for a factory at Kinston, N.C., and that 5000 series units could be available as early as mid-1989.

McConnell purchased the four-wheel-drive tractor line from the receiver for Massey Combines Corp. earlier this year. The purchase included all parts stocks for the 4000 series, tooling, fixtures, etc., McConnell has been shipping parts to MF dealers and MF supply depots since July, in accordance with an agreement with Massey-Ferguson.

General manager of McConnell Tractors, Ltd., is Ron McNeil.

Massey is believed to have sold about 3,000 of the 4000 series tractors while they were in production.

THE MF 5000 series, due to appear in 1989, will be made by McConnell Tractors, Ltd., Kinston, N.C.

Case IH will consolidate production of its rigid-frame and articulated four-wheel-drive tractors at its Fargo, N.D., plant, formerly Steiger Tractor Co.

When all four-wheeler production is housed at Fargo, there will be two rigid-frame and four articulated models, ranging from 213 to 375 horsepower. Production of Magnum two-wheel-drive models will remain in Racine. The Fargo plant, purchased by Tenneco in 1986, will make its first rigid-frame units in late 1989 or early 1990. The 4694 and 4994 rigid-frame models will be dropped from the line, as will the smallest articulated one, the 9110.

Uelner Resigns at D-A; Ratliff New President

Roy W. Uelner resigned Sept. 30 as president of Deutz-Allis Corp., effective Oct. 15. He has been succeeded by Robert J. Ratliff, who had been president of Uniroyal Tire Div. of Uniroyal, Inc., and before that had been an executive with International Harvester Co. for 27 years in its Truck Div.

Uelner has spent his entire business career with Deutz-Allis and its predecessor, Allis-Chalmers. He was president and CEO of A-C's Agricultural Equipment divisions in 1985 when they were sold to KHD, the West German industrial conglomerate which operates Deutz-Fahr in Europe.

Uelner, who is a past president of the Farm & Industrial Equipment Institute, said he intends to pursue other career or business opportunities.

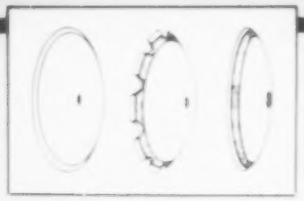
At Case IH: Global Marketing Organizations

Case IH President James K. Ashford has announced the setting up of worldwide marketing groups to serve its farm and construction equipment businesses separately. Case recently set up separate sales, manufacturing and engineering groups for these two businesses.

Each new marketing group will have product managers for each major line, responsible for developing and implementing separate business plans for each product within their lines.

Vickie L. Rickey has been named vice president, worldwide agricultural equipment marketing, and Stephen W. Scott has joined the company as vice president, worldwide construction equipment marketing. Both report to Ashford.

Rickey, who joined Case in 1975, is responsible for all product planning, product and service training, pricing, product and customer service, and all other marketing services activities.



Dealers give their major parts suppliers a C grade, but their answers indicate that they should take no prizes, either.

Who's Doing a Good Parts Marketing Job?

By BILL FOGARTY

THE CHALLENGE of arresting the dealer's loss of market share in replacement parts continues. At the NAEDA convention, Hugh Cottcamp (Ford New Holland) and Dan Ferris (Kubota), speaking as representatives of the Parts Committee of the Farm & Industrial Equipment Institute, reported on some findings of a recent FIEI survey of dealers.

The findings were not very uplifting, at least among the 715 dealers who responded. Cottcamp noted: "There's more than enough blame to pass around dealers and manufacturers alike."

Here's what Cottcamp and Ferris told the dealers at Vancouver:

Boss's attention. Parts provide 27 percent of the average dealership volume, but they get 12 percent of the general manager's time. Equipment sales provide 60 percent of volume and 29 percent of his time. General management duties take up 45 percent, service gets 9 and "other" gets 5 percent.

Delivery. Over half—54 percent—of dealers deliver parts. The others do not. Of those who deliver, 70 percent say they deliver 30 miles away and more.

Marketing plan. A third of respendents don't have one. Forty percent have a verbal one and 23 percent have a written one. Of those with a written or verbal one, 60 percent indicate that their employees understand and implement the plan "fairly well."

Telemarketing. Two-thirds don't; one-third do.

Supplier plan. Asked to rate their main supplier's parts marketing plan, 14 percent gave it an excellent, 48 percent said good, 27 percent said fair and 6 percent said poor. Two percent said there was none.

Understanding, agreeing. Eighty-eight percent said they understand their supplier's parts marketing plan

very well or fairly well. Eleven percent said they understand it not too well or not at all. Of those who understand it, 71 percent agree with it.

Supplier efforts. How do dealers regard suppliers' efforts to improve parts sales and operations? Dealers were asked to rate the suppliers on 22 factors using a scale of 1-to-10 (1=poor, 10=excellent.) The average was *six*.

Capacity of field people	6.2
Pricing and discounts	6.5
Catalogs	6.8
Order entry	7.3
Parts manager training	5.7
Parts sales training	5.4
Parts inventory training	5.0
Seasonal specials	6.2
Parts fair	5.4
Product information	6.4
Payment schedules	6.8
Warranty administration	7.1
Order till rate	7.2
Parts advertising	6.2
Responsiveness	5.9
Customer potential data	4.9
Obsolescence program	4.8
Computer support	5.5
Telemarketing	4.6
Yellow pages	4.7
Direct mail	5.8
On-time delivery	6.8

Call frequency. How often do dealers get a call from the parts rep? Monthly, say a third, quarterly, say a fifth, and 45 percent say twice a year or less. Eighty-three percent of the dealers said they would like to see a parts rep at least quarterly.

When he comes. Does the owner meet with the parts rep? Yes, in 71 percent of cases. Over half of those who do not meet with the parts rep say they'd like to do so.

Is he good? Asked to rate their parts rep on a scale of one to 10, responding dealers gave him/her a 4.3 rating—fair to poor.

Pricing. How do dealers price their parts in relation to list? Of the responding dealers, 54 percent price *at list*. Two percent price below list, averaging about 10 percent off. Thirty-eight percent of dealers say

they price *more than list*, by 10 percent on average.

Promoting. To promote parts, dealers cited these as media most frequently used: In-store displays, 77 percent; direct mail, 59 percent; newspaper, 55 percent; radio, 26 percent; telephone, 24 percent.

Co-op ad programs. Three-fourths of responding dealers said their main supplier has a co-op advertising program for parts. Of those who answered yes, 43 percent use the co-op program.

Alternate sources. Do dealers buy parts from other than their main supplier? Yes, answered 81 percent. Why? They cited these reasons:

Better prices, 74 percent; better quality, 7 percent; better delivery, 36 percent; broader coverage, 17 percent; better representation, 11 percent; parts not available from primary supplier, 67 percent; don't like the rep, 1 percent.

Improvement. Dealers were asked, "What one thing do you think is necessary from your primary equipment supplier to increase total parts purchases?"

Responses: Competitive price, 32 percent; availability and delivery, 20 percent; advertising and sales merchandising, 10 percent; terms, return policy, 5 percent; parts quality, 5 percent; training, 3 percent; field representation, 3 percent; other, 22 percent.

I&T comment. Please answer a few questions, anyone out there.

1. How can so many dealers—38 percent—price over list and then report that (a) they buy parts elsewhere because of better prices, and (b) the supplier is going to have to have a more competitive price? Are dealers expecting something of suppliers they don't do themselves in many cases? Or are they just talking about prices on the competitive items?

2. Dealers were asked if they understand their supplier's marketing plan. Maybe they should have been asked if they understand the co-op ad programs they apparently don't use much. I have seen manufacturers' explanations of their general co-op programs. They were very hard to track. Are parts co-op plans any more intelligible?

3. If under a third of responding dealers do telemarketing, how can the group give the supplier's telemarketing effort a so-so 4.6 rating?

4. Parts reps are rated fair to poor by dealers. But what are the standards of a good parts rep? Has anyone ever laid out the characteristics of a good parts rep and then told the dealer group, this is the performance standard, and our parts reps are going to meet it?

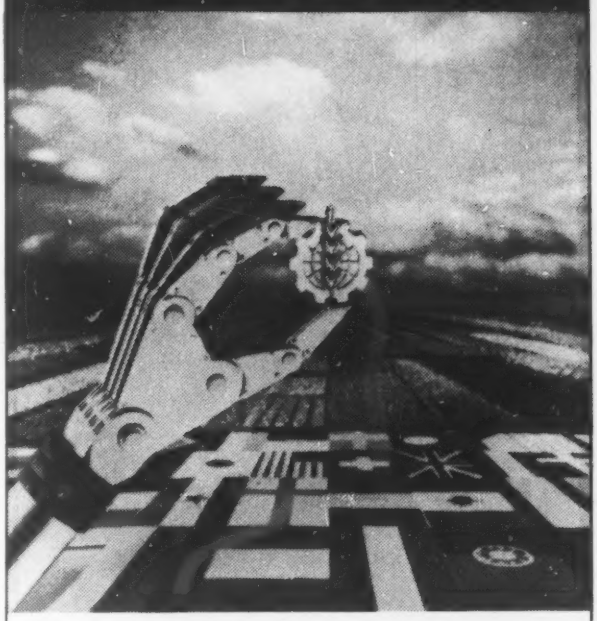
Prairie Manufacturers Report Sales Increases

With over 90 percent of its regular members reporting, the Prairie Implement Mfrs. Assn. says that its members' sales rose 18 percent from Aug. 31, 1987, to Aug. 31, 1988. Total volume recorded was $684 million (Canadian), compared with $578.3 million the previous year.

Export sales rose in the period from $190.5 million to $248.7 million. Reporting members expanded their outlays for R&D from $17.6 million to $24.7 million.

PIMA has 185 regular members. Sales out of Manitoba in the 1987-88 year were $392 million; Saskatchewan, $214 million; and Alberta, $78 million.

EUROPEAN FARMERS AT THE CROSSROADS



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I&T 100 YEARS OF LEADERSHIP

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January 1989

Seeding Practices Keep Changing

page 14

Tillage Equipment Market

LOOKING VERY GOOD

page 10

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NEW PRODUCTS FEATURED THROUGHOUT THIS ISSUE

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January 1989 • Vol. 104 • No. 1

On Our Cover

The 1989 sales season looks very, very good. Economics are right, and farmers are thinking moisture conservation. Only clouds: Materials shortages, drought possibilities.

(Cover photo from Case IH)

10

11: **Here's a** "new" tillage firm with a history that goes back to 1921. After a brief move to Texas, Athens Plow Co. is back in Athens, Tenn., under the direction of Willia Willson, the company's founder.

14: **You may** know how farmers have been seeding crops in your area for generations, but that might not be enough when it comes to helping them pick the right setup for today's needs.

18: **At the** 1988 FEWA-FEMA-AIMRA convention, there was a lot of exciting talk about the "best year we ever had," large sales increase and better receivables positions. At the time, many of the same manufacturers expressed concern the tightening supplies. Extended lead times were a worry, along with price increases.

21: **A summary** of the newly elected officers and directors of the Farm Equipment Wholesalers Assn., the Farm Equipment Manufacturers Assn., and the Agricultural & Industrial Manufacturers Representatives Assn.

23: **A special** seven-page section on new products begins here. Also, new tillage and new seeding products are shown on pages 12 and 16.

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BILL FOGARTY

What's Your Guess on Market Share?

What we're going to do today, dear readers, is play one of the industry's more popular parlor games. It's called *Who's Got the Market Share?*

Actually, this was once the only game in town. We all played it to the exclusion of anything else. That was before the big rage in speculative play became *Who'll Acquire Whom?* I like that game, too, but I must confess that I've never been very good at it. One of the things you need to play it is a straight face when some of the possibilities are tossed around. The time a guy sidled up to me and said, "I hear that New Holland is going to merge with Minneapolis-Moline," I laughed outright, and he wouldn't play with me anymore.

But *Who's-Got-the-Market-Share?* is good, clean sport. It's about something that's going on right now, not something that might happen next week or next year. And so I recently invited a number of industry watchers to join me for a few rounds, with the focus on the North American farm tractor market. A few responded. The others may have been out lubricating the track of another merger, for all I know.

One of my participants is Mitchell Quain, the watcher of capital goods industries for Wertheim Schroder, the New York financial house. Another player joins the game but declines to be identified. Mr. X. And the third is a newcomer, Tobias Levkovich of Smith Barney, another investment company. I bat fourth.

Let's open with the market for under-40-hp tractors. If the industry's product planners and researchers of the 1960s had been right, it wouldn't exist today, because everything in what we called the tractor market was destined to get *big*. It turned out that Japanese observers an ocean away had a less straight-jacketed vision of the potential for such products, and today they own just about every bit of it. (Levkovich sits this round out.)

Tractors under 40 hp	Mitch Quain	Mr. X.	Bill Fogarty
Case IH	10%	5%	8%
Deere	10	22	19
Deutz-Allis	5	2	5
Ford NH	15	20	19
Kubota	25	37	35
Massey	15	10	12
White	5	2	1
Others	5	2	1

It appears that Mitch miscalculated and lost 10 percent of market. It's deadline day, or I'd get back to him and ask him to allocate his missing slice.

Some of my reasoning: Kubota gets the biggest piece mostly because they got there first by a mile and they have never let up. Deere has the general marketing and dealer strength. Ford and Massey tractor dealer muscle is often found near populated areas where small tractors sell in quantity. I gave D-A 5 percent because Bill Templeton, its senior sales VP, came over from a successful seven-year stay with Kubota in 1986. It could increase.

Watch for some aggressive struggling in this corner of the business. The industry inventory levels have been exceeding a year's supply for quite a while. That costs money. The yen is strong in relation to the

dollar, and there's price resistance out there. On to the next horsepower group.

It doesn't seem so long ago to some of us that the 40-99 horsepower bracket was as big as row crop tractors got. And a few years ago, the last production of tractors this size left North America, replaced by units made in Europe, Japan and South America.

But hold everything! Word is out that White-New Idea will be introducing tractors in this horsepower range next month, tractors actually built here in the USA. Well, let's look at how the players are currently slicing up the market.

Tractors 40-99 hp	Mitch Quain	Mr. X	Tobias Levkovich	Bill Fogarty
Case IH	10%	20%	25%	18%
Deere	20	33	30	25
Deutz-Allis	5	4		6
Ford NH	15	25	25	25
Kubota	20	5		5
Massey	15	8	11	10
White	5	3		2
Others	10	2	9	9

It should be noted that Levkovich's share estimates come from a published market study he did recently for Smith Barney. Thus, D-A, Kubota and White are included with the others.

Why did I give such a strong slice to "others"? Well, we look at the retail sales reports issued by FIEI and its list of participants. But there are some imports in this horsepower grouping that are not included. "Others" also includes Long, Fiatagri, SAME, Belarus, Zetor and now Valmet.

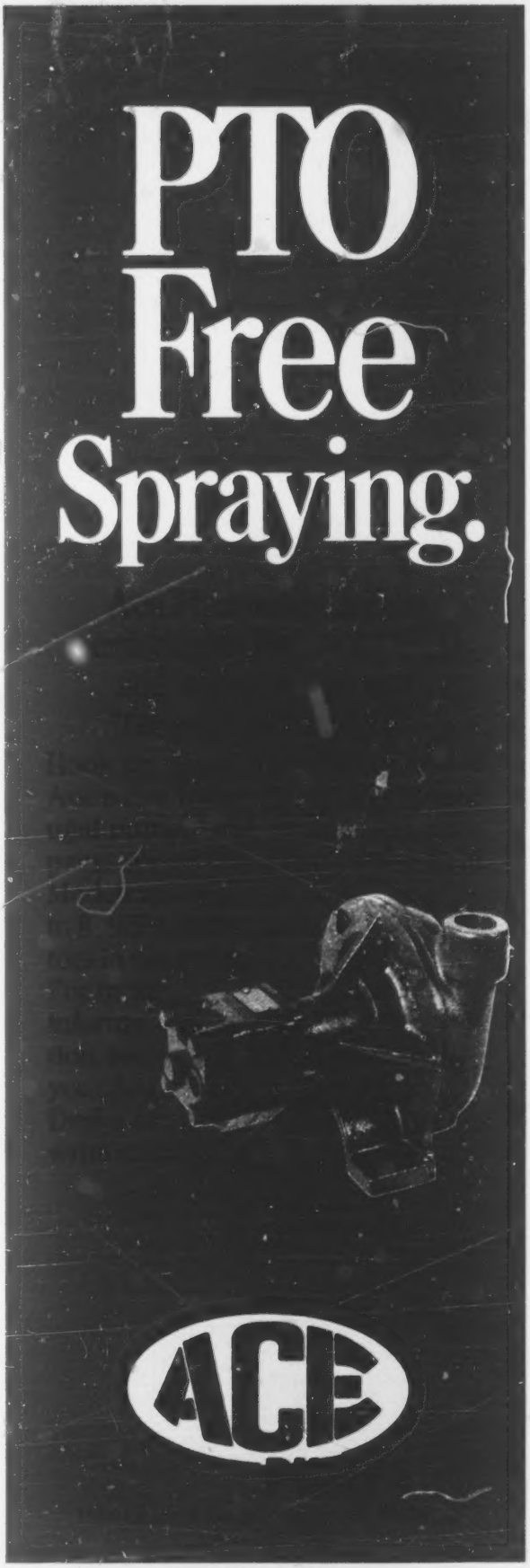
And now let us consider the great American specialty—two-wheelers of 100 horsepower and over. It doesn't take nearly as many sales of these units to roll up impressive dollar tallies. How does our panel carve up this grouping?

Tractors 100 hp/over	Mitch Quain	Mr. X	Tobias Levkovich	Bill Fogarty
Case IH	25%	33%	35%	33%
Deere	40	48	45	45
Deutz-Allis	5	5		6
Ford NH	15	5	5	4
Massey	5	2	3	4
White	5	5		6
Others	5	2	12	2

Again, Levkovich is including D-A and White in "others." Quain sees Ford as doing more big-tractor business and Deere and Case doing less than the rest of us.

Back in 1986 and 1987, I would have hesitated to play the market share game. At that time, discounting was so fast and furious, particularly in this horsepower

(See NOTEBOOK, pg. 30)



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INDUSTRY UPDATE

November Retail Sales Show Mixed Picture

RETAIL SALES OF U.S. farm equipment showed some pluses and some minuses in the November flash report of the Farm & Industrial Equipment Institute. Four-wheel-drive tractors, medium two-wheelers and hay tools had a good month and will post respectable year-end improvements. Drought is blamed for the decline in combine sales. Big two-wheeler sales are off largely because inventory is not as abundant. Small tractors, mostly from Japan, are down partly because of resistance to price hikes based on currency differences.

UNIT RETAIL SALES

	November			January-November		
Equipment	1988	1987	% Change	1988	1987	% Change
Farm Wheel Tractors:						
2-Wheel Drive						
Under 40 HP	2,780	3,106	(10.5)	51,486	56,570	(9.0)
40 & Under 100 HP	2,335	2,038	14.6	30,701	27,640	11.1
100 & Under 140 HP	250	376	(33.5)	3,857	4,574	(15.7)
140 HP & Over	856	909	(5.8)	10,474	9,863	6.2
Total 2-Wheel Drive	6,221	6,429	(3.2)	96,518	98,647	(2.2)
4-Wheel Drive						
Under 200 HP	95	35	171.4	876	490	78.8
200 HP & Over	141	91	54.9	1,560	906	72.2
Total 4-Wheel Drive	236	126	87.3	2,436	1,396	74.5
Total Farm Wheel Tractors	6,457	6,555	(1.5)	98,954	100,043	(1.1)
Combines (Self-Propelled)	609	967	(37.0)	5,490	6,365	(13.7)
Balers (Bales under 200 lbs.)	223	178	25.3	5,579	5,180	7.7
Forage Harvesters (Shear Bar Type)	158	152	3.9	2,335	2,180	7.1
Mower Conditioners	467	393	18.8	10,665	10,810	(1.3)

Michael Wolf to Head Case IH Ag Business

Michael A. Wolf has joined Case IH as executive vice-president and general manager of its worldwide agricultural business, according to James K. Ashford, president and chief executive officer. His responsibilities will include manufacturing, engineering, marketing and sales worldwide.

Wolf, 45, comes from a 17-year career with Firestone Tire & Rubber Co. Most recently, he was executive vice president.

Ketelsen: Case IH 'Could Be Sold'

An interview in the Dec. 12 *Wall Street Journal* quotes James L. Ketelsen, Tenneco Inc. chairman, as saying that it would consider selling off its J I Case subsidiary. "If I am convinced that we aren't going to make it and make it soon, I will do something about it," he reportedly said.

The article noted that for several years, the financial community has called for the sale of Case, which was described as "loss-ridden."

Despite the failure of the Case IH operation, formed four years ago with the acquisition of International Harvester's ag equipment division by Tenneco, to make profit forecasts, Ketelsen has said it would take five years to "reap the full benefits of the merger."

Ketelsen was quoted as saying that "Case IH can bring in operating profit of $300 million-$500 million." Its 1987 sales were $3.7 billion.

A Wall Street analyst told *I&T* that Tenneco's asking price for the Case operation would be $2.5 billion. "That would be a premium price. It is felt that some Japanese companies might be willing to pay something close to that. Tenneco and Fiat of Italy have had talks about the sale of Case for a long time."

INVENTORY WATCH

What's Happening To Stockpiles In Relation To Sales.

	U.S. Inventory Levels							12-Month Sales,
Equipment	Oct. 31, 1977	May 31, 1988	June 30, 1988	July 31, 1988	Aug. 31, 1988	Sept. 30, 1988	Oct. 31, 1988	Nov. 1, 1987-Oct. 31, 1988
Tractors								
Under 40 hp	59,399	59,761	57,223	58,976	61,345	61,282	60,565	55,099
40-99hp	18,996	19,954	19,490	19,861	20,635	20,805	19,966	33,459
100 hp and over	6,306	5,963	6,472	7,212	8,067	8,778	8,737	15,975
Four-wheel drive	1,474	1,714	1,659	1,727	1,704	1,749	1,567	2,583
Total Tractors	86,175	87,392	84,844	87,776	91,751	92,614	90,835	107,116
S-P Combines	4,496	4,185	4,143	4,082	4,138	3,844	3,585	6,642

Source: Farm & Industrial Equipment Institute

Canadians See Sales Improvement in 1989

The 1989 farm equipment market in Canada is expected to show an upswing in most product categories this year, according to a member survey of the Canadian Farm & Industrial Equipment Institute. In 1988, unit volume was off in most major product area.

Canadian reports include unit retail sales of front-wheel assist on two-wheel-drive tractors. The following table shows the percentage of FWA-equipped tractors sold in each horsepower category.

Product	1987	1988*	1989
Tractors, 2-WD			
Under 40 hp	4,630	4,141	4,235
(FWA, pct.)	(80%)	(78%)	(80%)
40-99 hp	9,021	8,906	8,931
(FWA, pct.)	(51%)	(52%)	(53%)
100 hp & over	3,065	2,572	2,829
(FWA, pct.)	(49%)	(53%)	(53%)
All 2-WD	17,700	16,712	17,145
(FWA, pct.)	(59%)	(59%)	(60%)
Tractors, 4WD			
Under 200 hp	508	544	575
Over 200	476	549	575
Total	984	1,093	1,150
Total Tractors	17,700	16,712	17,145
Combines, s-p	1,522	1,304	1,508
Combines, pull	350	300	375
Swathers, s-p	778	957	983
Swathers, pull	1,375	1,200	1,275
Balers (-200 lbs.)	1,594	1,491	1,540
Balers (+200 lbs.)	3,299	3,488	3,543
Forage Harvesters	458	588	570
Mower-Conditioners	2,481	2,809	2,785
Grinder-Mixers	208	275	283
Manure Spreaders	1,846	1,803	1,825
Moldboard Plows	340	580	580
Chisel Plows	1,014	1,080	1,073
Disk Harrows	468	502	544
Grain Drills	2,248	2,073	2,315
Corn Planters	308	349	385

*Estimated.
Source: Canadian Farm & Industrial Equipment Institute.

Harold Halter Dies; Managed FEMA 27 Years

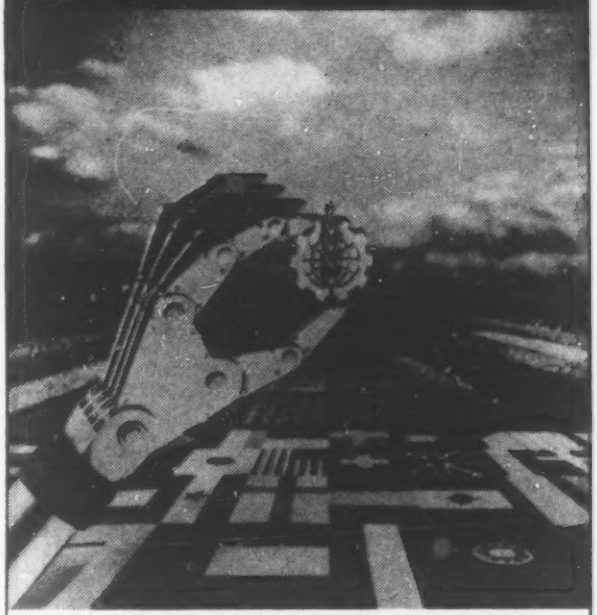
Harold B. Halter, who was executive vice-president of the Farm Equipment Manufacturers Assn. from 1956 to 1983, died Dec. 2 in St. Louis, Mo. He was 71. Under his management, FEMA grew from a few score member companies to 433 regular and 270 supplier member firms. Before joining FEMA as its first full-time manager, Halter had earlier been an executive with the North American Equipment Dealers Assn.

Halter was widely respected as an industry leader and commentator after his retirement. As an officer on the staff of Gen. Douglas MacArthur in World War II, he was awarded the Bronze Star and the Purple Heart.

Harold B. Halter

Halter is survived by his wife, Pauline, and one son, Steve.

EUROPEAN FARMERS AT THE CROSSROADS



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NOTEBOOK *(from page 7)*

category, that market shares went through temporary distortions. From here on out, it appears that changes in big tractor market shares will take place only on a gradual basis.

And finally, there are four-wheel-drive tractors. There was a time when North American farmers were buying them at a rate of over 11,000 units a year. Now we hear talk of a resurging market that may get up to 5,000 units in the near future. But remember that the bidirectional tractors, which are growing in popularity, are now included in FIEI reports of this category.

4WD Tractors	Mitch Quain	Mr. X	Tobias Levkovich	Bill Fogarty
Case IH	35%	33%	40%	35%
Deere	35	30	30	27
Deutz-Allis	5	3		0
Ford NH	25	27	25	30
Massey		1		1
White		2		2
Others		5	5	5

All but Quain give an edge to Case IH on four-wheelers. My thinking is that the Case and IH market shares before the acquisition of Steiger are enough to make Case IH dominant here. Ford NH's Versatile business includes bidirectionals. If we're talking about present markets, I understand that both D-A and MF are out of four-wheelers, but that MF will be back in sometime this year. As for the "others" slice, there are a few custom-built units always being turned out. And Mr. X wrote "mostly Cat" beside his entry, which was a point I decided to follow. That Cat Challenger isn't really a wheel tractor, but it's not a conventional crawler, either, and it is said to be taking a few deals away from the four-wheeler makers.

So there you have it. What do you think of it? I want to thank my colleagues in this foursome, and I hope I can get them and others to play it with me again sometime. And now let me confess something:

I'm writing this column late. It should have been in my publisher's hands days ago. But I have been constantly fiddling with my percentages. If I only had another week to ponder it all, make a few phone calls, etc., you'd see some differences.

Sales managers and dealers, I'm sorry if I've insulted you by underestimating your achievements. If I've overestimated and it either embarrasses you or makes you feel guilty, again I'm sorry. Would you care to give me the true facts?

Remembering Halter

One of the good things about this job is the chance it has given me to get to know a lot of people in this business. Some of them have been giants and inspired leaders. Some have been egomaniacs who contributed to the ruin of their companies or organizations, but not many. Most have been average guys like you and me, trying to understand or trying to get others to understand what they see.

When one of the good guys dies, you begin to think about his contributions and his personal qualities that attracted you and made you respect him. I've been doing that a lot since Harold Halter died in early December.

Halter managed the Farm Equipment Manufacturers Assn. for 27 years and in the process helped hundreds of small, new companies find their way into the industry. What I remember most about him is his marvelous sense of balance.

What do I mean by *balance*? I don't know what else to call it. Harold knew when it was time to take care of business and when it was time to enjoy the people he came in contact with. He knew what a host of workaholic big-shots with enormous salaries never stumbled on to: You can get your job done and help others with theirs by bringing a sense of humor to the whole business.

A prime example of this was FEMA's semi-monthly newsletter, the *Shortliner*. He knew how to provide the information his member executives needed from the FEMA office, and he knew how to sprinkle a few laughs throughout the pages, too. And guess what happened: When that distinctive green envelope was part of your morning mail, that was the first thing you opened and read, and you read all of it. As a result, that newsletter gave FEMA a very special sense of community. Harold probably knew all that perfectly well, but I think he made the *Shortliner* as good as it was (and remains today) just because he liked to share his fine sense of humor with others.

A lot of people in the industry will miss him, but we can consider ourselves blessed to have known him. □

LETTERS *(from page 5)*

management principles in the shop. Suppliers set the criteria for giving out the contract. And when dealer enterprises fail because they didn't manage the shop right, as often happens, suppliers pay a heavy price in terms of lost representation, in terms of the cost of finding a replacement dealer, and maybe most of all, in terms of what the whole process does to the supplier's reputation and product image.

And meanwhile, guys like you have had to slug it out in the trenches. But I have hopes that eventually managements at the very top will begin to understand that it is the service that makes one product superior to another, and that service has to be profitable.

Bill Fogarty

TILLAGE *(from page 12)*

that he'd better do some moisture conservation work."

Cohn: Another Increase in 1989

Marlon Cohn, manufacturer's representative for Haven Steel Co., Haven, Kan., and Case IH agricultural disks:

"In the fall of 1987, we were looking for a 10 percent increase in 1988. We got it and a little more. It was up about 12 percent. The drought had an effect. A lot of farmers went back to basic tillage, so the activity was greater. We're now expecting sales to be up in 1989 another 10 to 12 percent from 1988." □

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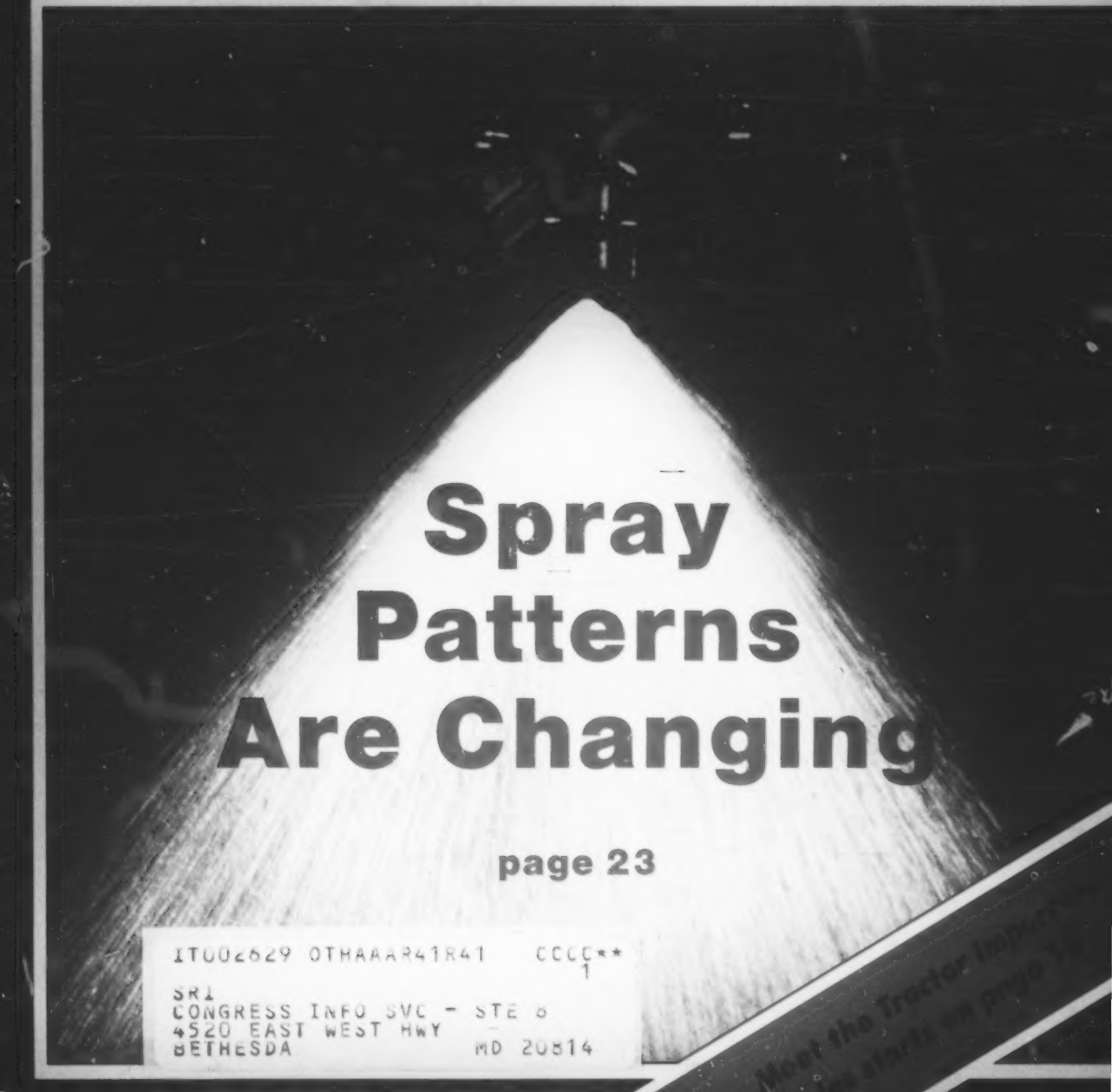
I&T 100 YEARS OF LEADERSHIP

D-A, MF Dealer Sessions **pages 12, 20**



Spray Patterns Are Changing

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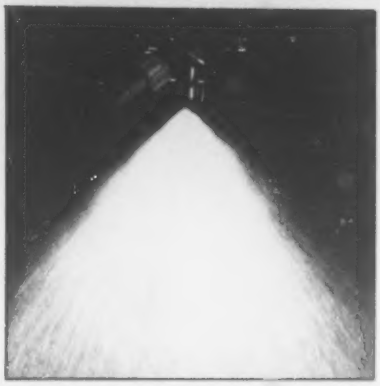

On Our Cover

There have been big changes in attitude about farm chemical use. Needed: New equipment development efforts, says expert.

(Photo courtesy Hardi, Inc., London, Ont.)

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Features

10: **The State of the Industry** survey, presented at the Farm & Industrial Equipment Institute's Marketing and Management conference, forecasts strong increases in dollar retail sales.

12: **Robert Ratliff** tells 800 dealers about moves to make the company more market-responsive, outlines strategies, warns financially weak dealers that they may not survive.

16: **Tractor Importers, Part I:** A couple of tractor business veterans find the southeastern U.S. a receptive market for the IMT line.

20: **They still make tractors,** but Massey executives are putting the focus on getting demand-oriented products to their dealers. It means sourcing quickly and making alliances with strategic shortliners.

27: **New tractors** from Deere and Ford New Holland are featured.

28: **Three consultants** comment on a dealer's inquiry about the true cost of open accounts on parts and service.

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FIEI Issues Final 1988 Report of Retail Sales

HERE'S HOW RETAIL SALES of farm equipment turned out for 1988, according to the flash report of the Farm & Industrial Equipment Institute.

UNIT RETAIL SALES

Equipment	December 1988	December 1987	December % Change	January-December 1988	January-December 1987	January-December % Change
Farm Wheel Tractors:						
2-Wheel Drive						
Under 40 HP	2,867	3,315	(13.5)	54,344	59,885	(9.3)
40 & Under 100 HP	2,384	3,054	(21.9)	33,083	30,694	7.8
100 & Under 140 HP	468	510	(8.2)	4,323	5,084	(15.0)
140 HP & Over	1,334	955	39.7	11,804	10,818	9.1
Total 2-Wheel Drive	7,053	7,834	(10.0)	103,554	106,481	(2.7)
4-Wheel Drive						
Under 200 HP	123	111	10.8	998	602	65.8
200 HP & Over	171	146	17.1	1,731	1,051	64.7
Total 4-Wheel Drive	294	257	14.4	2,729	1,653	65.1
Total Farm Wheel Tractors	7,347	8,091	(9.2)	106,283	108,134	(1.7)
Combines (Self-Propelled)	505	805	(37.3)	5,995	7,170	(16.4)
Balers (Bales under 200 lbs)	151	172	(12.2)	5,732	5,352	7.1
Forage Harvesters (Shear Bar Type)	71	100	(29.0)	2,406	2,280	5.5
Mower Conditioners	399	429	(7.0)	11,041	11,239	(1.8)

Deere's 1988 Sales: $5.365 Billion

Deere & Co. has reported net income for fiscal 1988, ended Oct. 31, of $315 million, compared with a strike-affected net loss in 1987 of $99 million. The record earnings benefitted by $69 million from tax loss carry-forwards.

Net sales for fiscal 1988 were $5.365 billion, up 30 percent on 1987's $4.135 billion. Production was 34 percent higher for the year and up 11 percent in the fourth quarter.

Deere's manufacturing and marketing operations earned $180 million in 1988 compared with a loss of $193 million in strike-affected 1987. Net income of retail finance, leasing and insurance operations increased from $90 million in 1987 to $130 million in 1988.

Farm equipment and consumer products volume in 1988 was $4.203 billion, compared with $3.223 billion in 1987. Industrial equipment sales rose from $911 million in 1987 to 1988's $1.162 billion.

Deere & Co. is setting initial production schedules of all products for 1989 at a level about 11 percent higher than actual 1988 output. North American ag equipment production schedules are up strongly.

Varity's MF: 9-Month Sales $960 Million

Varity Corp. has reported that in its first nine months, the farm and industrial machinery segment of its business produced $960 million in sales, compared to $786 million for the same 1987 period. Total sales for Varity were $1.661 billion in 1988's first nine months, compared with $1.38 billion in 1987.

Net income before extraordinary items in the first three quarters was $29.9 million in 1988, compared with $5.4 million a year earlier. Extraordinary items in 1987—the writing off of Varity's Massey Combines Corp. investment—produced a nine-month loss of $17.3 million for a net loss of $11.9 million. For 1988, the extraordinary item was realization of tax benefits of the previous year's losses, producing a net nine-month income of $53.7 million.

Changes...

Roger Miskelley is new marketing manager for the Lawn & Garden Div. of Briggs & Stratton Corp.

Briefly...

Oshkosh Truck Corp., Oshkosh, Wis., will acquire Deere & Co.'s motorized vehicle chassis business. During a 12-month transition period, Deere will supply Oshkosh with chassis and support services. The deal is expected to add about $100 million to Oshkosh sales.

—

Edward Fritz, manager of Case IH components endurance and field testing, has received the 1988 FIEI Engineering Merit award. His career has included professional society work in the area of rollover protection on farm equipment, and he is currently chairman of FIEI's Farm Equipment Div. Ag ROPS Committee.

—

Construction equipment distributors expect customer demand for equipment rentals and good used equipment to produce a 3.6 percent increase in sales for the first half of 1989 over the same period in 1988. While cautiously optimistic, says Associated Equipment Distributors of its members, they are also looking at a projected economic slowdown or downturn in the second half. Manufacturers are anticipating a 3 percent dip in total sales for the first half.

—

Shipments of outdoor power equipment in the 12 months ending Aug. 31, 1988, were down 3 percent, according to the Outdoor Power Equipment Institute, but they topped the 7-million-unit mark for the second consecutive year. Walk-behind mowers declined 5 percent at 5.6 million units; rear-engine riding mowers were equal with 1987 at 375,000 units; front-engine lawn tractors went up 1.5 percent to 812,000 units. Declines were blamed primarily on widespread drought conditions.

Looking for a STRONG 1989

By Bill Fogarty

WITH everything else solidly in place for a strong sales year, farm equipment manufacturers may quietly be contemplating rain dances, novenas, prayer vigils and other potential wet weather invocations.

The State of the Industry survey, presented early this month at the Farm & Industrial Equipment Institute's Marketing & Management conference at Tucson, forecasts strong increases in dollar retail sales. The Farm Equipment Div. of FIEI expects an increase of 8 percent. The Agri-Equipment Div. looks for a 5 percent rise.

Only the concerns about continuation of the drought in key agricultural areas provide a substantial damper to the sales outlook.

Manufacturers were asked to cite the key elements that would be more positively influential in 1989 than in 1988 in farmer buying decisions. The strongest of these elements were:

Farmers' attitudes about buying equipment; commodity prices; the condition of the agricultural equipment fleet; the number of planted acres; replacement demand; farmers' gross cash receipts; net farm income; and U.S. grain exports.

Parts volume

Manufacturers of field equipment expect a 5.0 percent rise in dollar volume sales of parts. Farmstead equipment makers set it at 5.0 percent. Some of the reasons given for the optimism were:

Better merchandising programs by manufacturers and dealers; heavy population of high-hour used equipment; increased acreage plantings will require repairs; larger yields; increased awareness of the aftermarket parts business; increased OEM efforts to maintain and increase market share; prices will increase; very low inventory at majority of levels; dry soils in 1988 creating added wear on an aging fleet; improved outlook encourages maintenance.

Some surveyed marketing executives from both divisions saw no change coming in parts volume, however. Among their reasons:

Replacement machines are taking away parts sales; survey of our dealers indicates no change; more pressure from non-industry competitors.

Ranges of outlook

The percentages of change in unit volume, as shown in the tables, are median figures. Each question about product unit sales, total industry outlook and parts volume produces a range of answers, some of them quite broad.

The FED outlook for an 8 percent total increase derive

U.S. Retail Sales Forecast, 1989-1990 (in units)

Product	1988 Sales (est.)	Forecast 1989	Pct. Change	Forecast 1990	Pct. Change
Tractors					
Under 40 Hp	54,344	54,344	0	54,344	0
40-99 HP	33,083	34,737	+5.0	35,779	+3.0
100 HP and over	16,127	18,465	+14.5	19,383	+5.8
4WD	2,729	3,029	+11.0	3,075	+1.5
All Tractors	106,283	110,535	+4.0	111,635	+1.9
S-P Combines	5,995	8,095	+35.0	8,945	+10.5
Corn Heads	3,375	4,607	+36.5	5,091	+10.5
Forage Harvesters[1]	2,406	2,493	+3.6	2,555	+2.5
Balers, square[2]	5,732	5,784	+0.9	5,784	0
Balers, round[3]	11,100E	11,433	+3.0	11,550	+1.0
Windrowers	1,750	1,820	+4.0	1,829	+0.5
Mower-Conditioners	11,041	11,262	+2.0	11,262	0
Grinder-Mixers	2,700	2,511	7.0	2,511	0

E: Estimated by I&T. [1]Shear-bar type. [2]Bales under 200 lbs. [3]Bales over 200 lbs.

Source: Farm & Industrial Equipment Institute

from a range of zero (one vote) to plus 18 percent (one vote) among 28 participants, with a fairly even sprinkle of opinions in between.

The AED's range is much broader, running from minus 25 percent to plus 20 percent. There were 18 upside votes, two looking at no change and two downside views.

Other Product Retail Sales Forecasts, 1989-1990

Product	Percent of Change 1989 from 1988	1990 from 1989
Augers, elevators	0	+10.0
Crop Dryers, in-bin	0	0
Dairy/Beef Equipment	+5.0	+4.0
Hog Equipment	+3.5	0
Grain Bins	0	+15.0
Milking Machines	+4.5	5.0
Manure Spreaders	+1.7	0
Moldboard Plows	+5.5	-2.0
Disk Harrows	+15.0	+2.5
Field Cultivators	+6.0	+2.3
Chisel Plows	+5.0	+2.5

Source: Farm & Industrial Equipment Institute

Forecast track record

At the start of 1988, forecasters were expecting sales of tractors under 40 horsepower to hold at 60,000 units. Actual volume was about 9 percent less. Sales of 40-99-hp tractors at 33,500 were better than the expected improvement of 31,210 units. Similarly, sales of over-100-hp tractors came in at about 16,000, bettering last year's prediction of 14,500 units sold. Four-wheeler sales were expected to decline to 1,500 units from 1987's 1,600. Instead, they finished far ahead at 2,625 units.

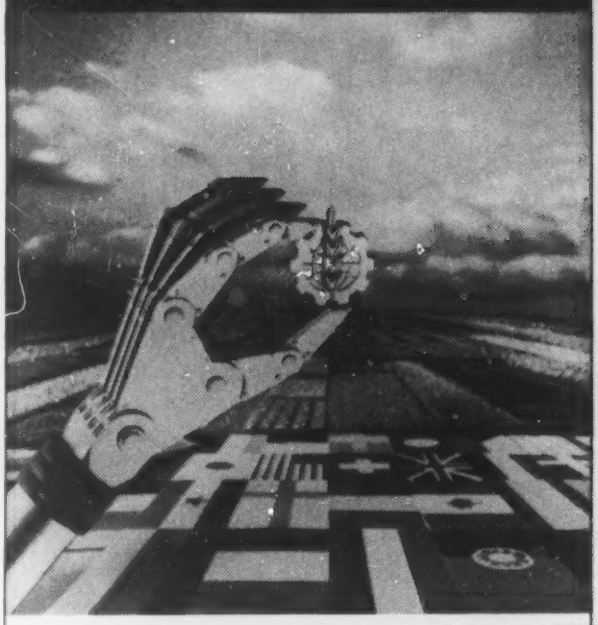
Combine volume was expected to be 6,890 units in 1988, better than 1987's 6,700, but drought intervened and actual sales were about 6,100 units. Similarly, corn head unit volume was predicted at 4,100 and came in at 3,375.

Forage harvester volume for 1988 finished slightly ahead of the predicted 2,400 at 2,475. Square baler sales were forecast for 5,400 units and came in at 5,700. Round baler volume was anticipated to be 10,350 and did better in the year at 11,100.

Windrower sales were expected to finish down from 1987's 1,6[illegible] units at 1,500, but instead, they finished at the 1,750 mark. Mower-conditioners were predicted to come in at 11,500 and they came in at 11,000. Grinder-mixers finished at about 2,700 units, well ahead of the forecast 2,050.

The above figures for 1988 may not coincide entirely with the FIEI December flash report, appearing elsewhere in this issue. The 1988 figures include 11 months' actual sales plus estimates for December. □

EUROPEAN FARMERS AT THE CROSSROADS



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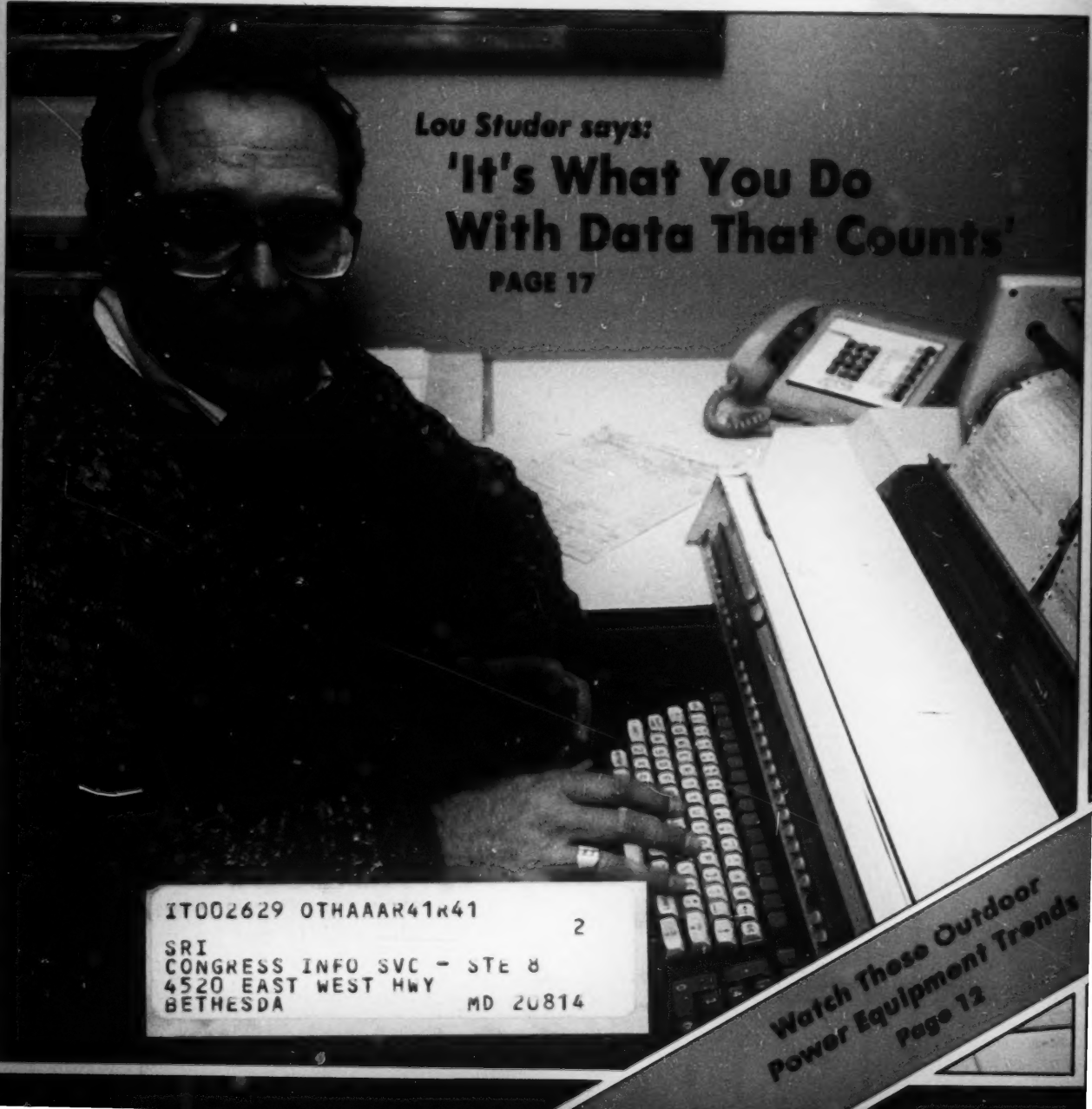
March 1989

Deere's New Product Salvo

page 22



Lou Studor says:

'It's What You Do With Data That Counts'

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Watch These Outdoor Power Equipment Trends

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Farm Press Publications, Inc.

I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

The business magazine of the farm and industrial equipment industry.

March 1989 • Vol. 104 • No. 3

On Our Cover

Here's the story of one dealer's approach to sales and how he uses computer-generated data to make more profit.

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Retail Sales Start The Year With Thud

RETAIL SALES of farm equipment were down in January for most major reported product categories, according to the Farm & Industrial Equipment Institute flash report.

On the consoling side, the FIEI always attaches this cautionary paragraph to the end of each flash report:

"These data are, in part, estimates which are subject to revisions when final detail data become available. Because of the seasonal nature of the industry, comparisons of monthly data from one period to another should be done with extreme caution. These data represent most, but not all, of the manufacturers in each product category...."

	Unit Retail Sales		
	January		
Equipment	1989	1988	% Change
Farm Wheel Tractors:			
2-Wheel Drive			
Under 40 HP	2,232	3,135	(28.8)
40 & Under 100 HP	2,229	2,377	(6.2)
100 & Under 140 HP	418	510	(18.0)
140 HP & Over	1,289	1,247	3.4
Total 2-Wheel Drive	6,168	7,269	(15.1)
4-Wheel Drive			
Under 200 HP	99	66	50.0
200 HP & Over	165	114	44.7
Total 4-Wheel Drive	264	180	46.7
Total Farm Wheel Tractors	6,432	7,449	(13.7)
Combines (Self-Propelled)	365	602	(39.4)
Retangular Balers (Bales under 200 lbs)	297	188	58.0
Forage Harvesters (Shear Bar Type)	85	63	34.9
Mower Conditioners	428	289	48.1

Exports, Imports Up In 1st Nine Months

In the first nine months of 1988, both exports and imports of farm equipment from and to the U.S. recorded strong increases, according to U.S. Dept. of Commerce data.

Exports rose 24 percent from the same period of 1987 to $1.466 billion while imports increased 30 percent to $1.717 billion.

Major U.S. customers and their volumes of equipment purchases: Canada, $472 million, down 9 percent; France, $102 million, up 41 percent; Saudi Arabia, $93 million, up 25 percent; Australia, $87 million, up 168 percent; Mexico, $81 million, up 65 percent; United Kingdom, $80 million, up 66 percent; Belgium, $65 million; West Germany, $60 million, up 39 percent; Venezuela, $46 million, up 36 percent; South Africa, $30 million, up 63 percent.

Principal sources of imports: Canada, $447 million, up 28 percent; Japan, $317 million, down 3 percent; United Kingdom, $278 million, up 62 percent; West Germany, $227 million, up 24 percent; Italy, $120 million, up 26 percent; France, $97 million, up 130 percent.

Group Seeks to End Steel Import Quotas

An organization calling itself the Coalition of American Steel Using Manufacturers has been formed in Washington, D.C., to fight a proposed extension of import quotas on steel. The group has released a study which it says shows "the economic harm caused by these quotas."

Among the 189 member companies and organizations listed in the coalition is the Farm & Industrial Equipment Institute. Also involved are these firms connected with the farm and industrial equipment industry: Can-Am Industries, Caterpillar Inc., Clark Equipment Co., Cummins Engine Co., Sundstrand-Sauer Co. and Tenneco Inc.

The steel quotas, known as voluntary restraint agreements, are scheduled to expire Sept. 30, 1989. American steelmakers are pressing the administration to extend them until 1994 and expand them to cover more products and countries, according to CASUM.

CASUM is located at 555 Thirteenth St. N.W., Washington, D.C. 20004-1109, telephone 202-637-8622.

Deutz-Allis Moving HQ To Atlanta

Deutz-Allis Corp. will relocate its corporate headquarters from West Allis, Wis., to Atlanta, Ga., according to Robert J. Ratliff, president and chief executive officer.

West Allis has been the company's base since it was established in 1985 and before that the headquarters since the founding of Allis-Chalmers, one of its predecessors. The other predecessor, Deutz Corp., a subsidiary of KHD, a German conglomerate, had been based in Atlanta since the 1960s.

Ratliff said closing the West Allis office will save the company $1.5 million. Completion of the move is set for June 30. By then, some of the West Allis-based corporate staff will be sent to Atlanta. Others will move to offices in Batavia, Ill., where the company's parts operations are based, Independence, where the Gleaner combine works is located, and other regional offices. The West Allis office employs about 135 people.

Citicorp deal. Deutz-Allis and Citicorp., the largest provider of financial services in the U.S., have announced an agreement whereby Citicorp will provide a "wide range of financial services to Deutz-Allis and the dealer organization."

Briefly...

Farm Equipment Mfrs. Assn. Spring Management Clinic is set for April 1-5 at the Doubletree Hotel, Tucson, Ariz. Program focuses on manufacturer-supplier concerns.

New Trends in Outdoor Power Equipment

People change, markets change. Fresh product ideas generally follow. Here's a look at some movements and the responses they have generated.

By SCOTT NESBITT

THERE'S A new, highly competitive situation in the lawn and garden business. Be thankful of it. It's generating a lot of new products and technical improvements that make for an exciting market.

Consider these trends that are driving the lawn and garden industry in some new directions:

Baby boomers are getting a bit older, stiffer at the knee. Lots of these citizens are deciding they prefer a green thumb to tennis elbow. So gardening has become the new rage in Yuppieville, and there are products to satisfy the demand.

Ecological concerns are starting to come true. In some areas, landfills are running out of room and no longer accept organic matter, or charge plenty for it. Again, there are products for the problem.

Single-family housing has been substantial in recent years: 750,000 in 1986, 671,000 in 1987, 677,000 in 1988. Experience shows that many of these new homeowners will try to get by with inadequate outdoor power equipment the first year or two, then become candidates for good, new machinery after becoming disenchanted with their discount-store mowers.

Despite drought in 1988, sales of all outdoor power equipment categories were up from 1987 except for walk-behind mowers. Even these declined only 5 percent to 5.6 million units. Other products had this experience:

Product	Unit Sales	Pct. Change
Garden tractors	170,000	+13.3
Front-engine riders	800,000	+1.4
Rear-engine riders	375,000	0
Rotary tillers	272,000	+4.7

Conditions seem right for dealers who can work with customers to find lawn maintenance machines that are right for the job. (Remember, trees are part of the lawn.) Dealers who can demonstrate should be in a particula good position.

Tight turns

For a lot of dealers, 1989 may down as the year buyers got seri about tight-turning riding mowe thanks to technical developme from some of the big companies.

Dealers who have handled zero-turning-radius or front-d mowing rig know there is so customer reluctance to buy s machines. They just don't han like the family car. The ones t use sticks or stalks for steering t some getting used to, and pec like a steering wheel in their han

Also, many front-deck, rear-s machines, though they have a st ing wheel, provide a jerky steer feel as the machine's mass is be turned. Again, more getting u to. Many shoppers have t turned from such innovations discount-house riders with t desirable auto-steer feeling. that may be starting to change.

Toro hits the market this y with the HMR (highly man

(See TRENDS, page 14)

verable rider) series, including two models, a 12-hp, 38-inch-deck unit and a 16-hp, 44- or 52-inch-deck unit. It looks like a normal rear-engine rider, but the front wheels turn 80 degrees in either direction, providing a 4-inch turning radius. The problem of rear-wheel hop in tight turns is solved by using two separate 5-speed transmissions and some freewheel clutches. The net effect is a rider that takes no learning to operate and turns at almost zero radius.

Two other firms have brought out tight-turning front-engine riders whose rear wheels turn in conjunction with the front wheels.

Kubota has this four-wheel steering on three models, two diesels with 16 and 18 hp, and a gasoline version at 21 hp. All are liquid-cooled and handle mowing decks of 48, 54 and 60 inches plus other garden implements. Called the G series, it also has hydrostatic transmissions and cruise control.

Noma Outdoor Products also has a front-engine rider with four-wheel steering, with plans for a 12-hp, 40-inch-deck model for this season.

These offerings join the radical Honda RT5000 that came out in 1987 with four-wheel steering *and* four-wheel drive. Unlike the Honda, the Kubota and Noma mowers are not complex marvels of engineering, but they are straightforward designs that go a step ahead of their bretheren.

They are not likely to sell themselves sitting on the showroom floor. The reduced mowing time and convenience of design will have to be shown on someone's lawn, where families will see their advantages. The good news for dealers is that these machines are just conventional enough to make potential buyers comfortable, but they are also distinctive enough to set themselves apart.

Is that a big selling point? Consider: Walk-behind sales are down and riding sales are up. As the mowing population ages, riders are seen as being the machine of choice for more buyers. Some corporate planners expect the next big wave of growth will be in smaller-sized riding mowers with extremely high maneuverability as obstacles continue growing and being installed on America's lawns.

Improved walk-behinds

Meanwhile, manufacturers are improving walk-behind mowers and new firms are joining the fray. With a simple walk-behind retailing for $200 and complex, electric-start, self-propelled models edging over the $500 mark and reaching toward $700 for the upscale brands, there's a lot of money in that market.

Walk-behinds are improved in several ways:

Better engines, with electronic ignitions, precision carburetors and sometimes overhead valves, have made starting a one-pull operation. Some brands guarantee it.

ATTACHMENTS to broaden the utility of outdoor power units continue to multiply. Lawrence Inc. puts its hopper on front-mount mowers and on tractors with Category I 3-point hitch. Also available: steel fork set, tote platform bracket kit, scoop, tool organizer.

Cables and gizmos that were added to comply with industry safety standards in the early 1980s are now well-incorporated into the machines. A mower user should no longer have to fight the starter rope to remove the grass bag, for instance.

Better designs are now on hand that allow conversion from rear bagging to side-discharge to mulching operation by simply installing, without tools, the appropriate attachments.

Warranties of two years are common; some are longer. Warranties emphasize the benefits of having a servicing dealer.

One-speed self-propelled mowers are fading from the scene. The best new machines offer three to five fixed speeds; more are offering variable speed drives to match operator desires exactly.

Honda shook up the walk-behind mower market in the early 1980s with a product line that set today's standards for technical refinement, user convenience, easy starting and quiet operation. They proved premium mowers will sell if they are really better.

For dealers who missed that opportunity, other foreign manufacturers are getting into the U.S. market with attractive products. In fact, the field is getting crowded. Here's an update:

Echo, the Japanese chainsaw and blower people, have walk-behinds using a Homelite/Jacobsen chassis with both Echo and Briggs & Stratton engines. There are also Echo engines available as premium replacements for other brands of lawn mower.

Husqvarna, the Swedish chainsaw firm, has B&S engines on their walk-behind mower decks made of plastic and featuring "ergonomic" handles. They also have a front-deck rider with articulated rear steering.

Solo, German horticultural sprayer and chainsaw makers, have walk-behind mowers with the ability to cut and bag the denser grasses found in the damp parts of Europe. So far, they are using B&S engines but are capable of building their own.

Sachs-Dolmar, German chainsaw firm with a big tie into automotive transmissions and moped engines, bring in a line of walk-behinds featuring their own engine. **Ariens,** the Wisconsin tiller and rider people who got back into walk-behinds a few years ago, are using the same Sachs engine on their mowers.

Kubota walk-behinds feature an engine they build and a special turbo suction fan they say improves bagging power.

Yamaha, maker of motorcycles and pianos, brought out riding mowers last year, using engines

adapted from their golf carts, and is now showing prototype walk-behinds.

What makes these new entries any different or better than the domestic products? Generally, the wheelbases are longer, for better straight-line stability and balance against a loaded grass bag. Designs avoid side-snag against things like chain-link fences. The overall level of quiet, finish, feel and styling are considered by many to be a step up. Also, they're not likely to be found in mail-order catalogs and discount stores.

Mini-tillers

A relatively new product turning up in many places is the mini-tiller, the little dirt churner that can be picked up in one hand. These machines, from Hoffco, Mantis and others, can turn dirt to a practical depth of three or four inches, making them useful for readying seedbeds. They're fine for cultivating because they do the job of a hoe without the sweat. There are

SOLO, a European import, typifies a style trend with shielding on the sides and snag-proof wheels.

options like a sidewalk edger and dethatching tines.

The net effect of these machines is that they are multi-purpose lawn and garden maintenance machines. The drawback and the opportunity lie in the fact that customers are unfamiliar with the general concept. The advantage goes again to the dealer who can find a way to demonstrate the tool *without* investing more time and money than can be realized from selling it. Retail prices run from about $250 to $500, about like good and string trimmers.

Mini-shredders

Landfills are filling up, particularly on the East and West Coasts and in larger midland cities. The Environmental Protection Agency has strict rules for drainage and covering these dumps. The result has been that many dumps no longer accept loose or bagged leaves or twigs and branches. Others will, but they add a surcharge which trash hauling services pass back to customers.

Enter the mini-shredder.

The idea of the shredder is that ground-up wood and leaves decompose quickly and can be kept in a compost pile in the backyard. Or wood chips can be spread under trees and shrubs as a mulch. The mulch helps shield the soil from ex-

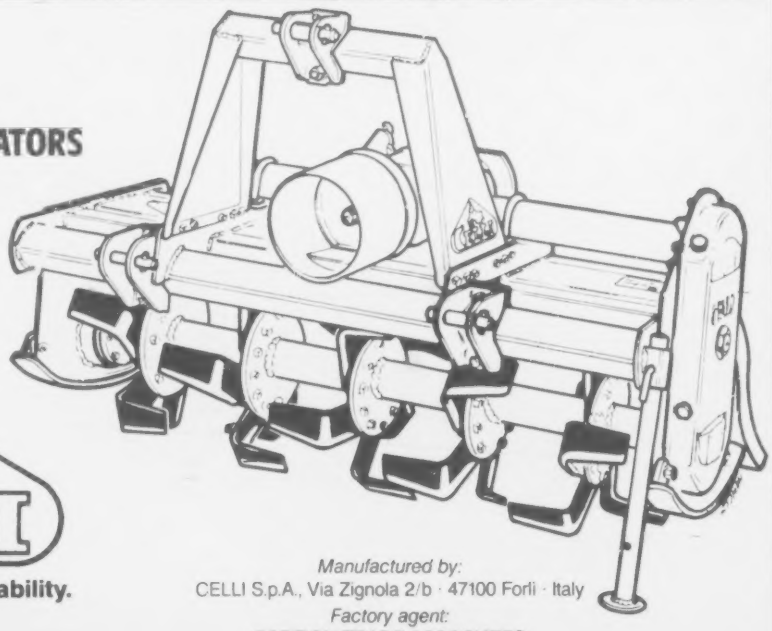
(See POWER, pg. 30)

ROTARY TILLERS

STRAIGHT TINE CULTIVATORS

POWER HARROWS

SPADING MACHINES



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INVENTORY WATCH

What's Happening To Stockpiles In Relation To Sales.

Equipment	U.S. Inventory Levels Dec. 31, 1987	July 31, 1988	Aug. 31, 1988	Sept. 30, 1988	Oct. 31, 1988	Nov. 30, 1988	Dec. 31, 1988	12-Month Sales, Jan. 1, 1988-Dec. 31, 1988
Tractors								
Under 40 hp	60,179	58,976	61,345	61,282	60,565	59,952	59,117	54,741
40-99 hp	20,042	19,861	20,635	20,805	19,996	20,024	20,602	33,154
100 hp and over	5,524	7,212	8,067	8,778	8,737	9,696	9,620	16,122
Four-wheel drive	1,697	1,727	1,704	1,749	1,567	1,495	1,401	2,729
Total Tractors	**87,442**	**87,776**	**91,751**	**92,614**	**90,835**	**91,167**	**89,339**	**106,746**
S-P Combines	3,588	4,082	4,138	3,844	3,585	3,435	3,396	5,955

Source: Farm & Industrial Equipment Institute

LONG *(from page 20)*

paint, hoses, seals, seats and lighting packages.

Products, markets

Long has targeted the weekend farmer as its prime market. Its tractors have horsepower ratings of 28, 36, 42, 49 and 64 at the pto. Eventually, the company intends to expand the horsepower range in both directions, but toward the higher end first. Cabs for the tractors are sourced domestically.

Long officials say that all the tractors are pre-sold when they come off the Tarboro line. The company provides floor planning for all its dealers.

In 1979, grain bins accounted for 40 percent of Long Mfg. N.C. sales. Irrigation equipment generated about 20 percent. Today, these two categories produce less than 30 percent of revenues.

Ten years ago, implements were 3 percent of volume. Today they make up 20 percent of it.

Tractors in 1989 are expected to comprise almost 45 percent of sales. Grain bins, cotton wagons, peanut combines, loaders, backhoes and irrigation systems continue to represent Long's effort to maintain a position in the market serving row-crop farmers. The company feels it is in a flexible enough position as a manufacturer to shift production to other related types of equipment as demand arises.

For 1989, Long expects to increase revenues by 25 percent to $30 million and to generate incrementally higher profits as a result of its stabilized overhead structure. This substantial improvement over 1988 results is expected to come primarily from sales of tractors and implements. But due to the resurgence of the agricultural market, Long Mfg. looks for an improved market for its specialty products: tobacco barns, grain bins, peanut wagons and plenims, cotton wagons and its new line of heavy-duty cutters.

William Long, the company's founder, is now retired. Long Mfg. N.C., Inc., is now owned by a group of institutional investors. □

DEERE *(from page 23)*

system have been redesigned and new turbochargers installed.

The models are: The 4055 (105-pto horsepower, 65-gal. fuel tank, 6,550-lb. hitch lift capacity); the 4255 (120 pto hp, 65-gal. fuel tank, 6,550-lb. hitch lift capacity); the 4455 (140 pto hp, 65-gal. fuel tank, 6,550-lb. hitch lift capacity); the 4555 (155 pto hp, 102-gal. fuel tank, 8,870-lb. hitch lift capacity); the 4755 (175 pto hp, 102-gal. fuel tank, 8,870-lb. hitch lift capacity); and the 4955 (200 pto hp, 102-gal. fuel tank, 9,710-lb. hitch lift capacity).

The 16F/6R Quad-Range transmission with Perma-Clutch is standard on all models except the 4955. The deluxe full-powershift transmission (15F/4R) is standard on the 4955 and optional on the 4055 through 4755.

A pressure-compensated closed-center hydraulic system maintains standby pressure of 2530 psi. Two poppet-type selective control valves with ISO breakaway couplers are standard; a third one is optional on the 4055, 4255 and 4455. On the larger ones, three valves are standard and a fourth is available as an option.

Deere says that the series, equipped with most popular options, has a price range from $46,000 to $88,000.

POWER *(from page 15)*

cessive sunlight and retains moisture.

After last year's drought, that's a pitch many homeowners can understand. Pay for the shredder by saving on trash-hauling fees. Prices range from $300 for some electric units to $500-$600 for small, 3-hp shredders and up to $1,000 and more for 8-hp models.

Again, demonstration is important on shredders because they're new to most homeowners. Many buyers will need assurance that something that mulches wood can be as safe as the kitchen garbage disposal unit.

Ned Van Woert, a marketer with Troy-Built, said studies show the median family income for shredder purchasers is $38,000, with most owning some land around their homes.

"We want people to see the product as an outdoor garbage disposal. They have one in their sink. Why not one in their backyard?" □

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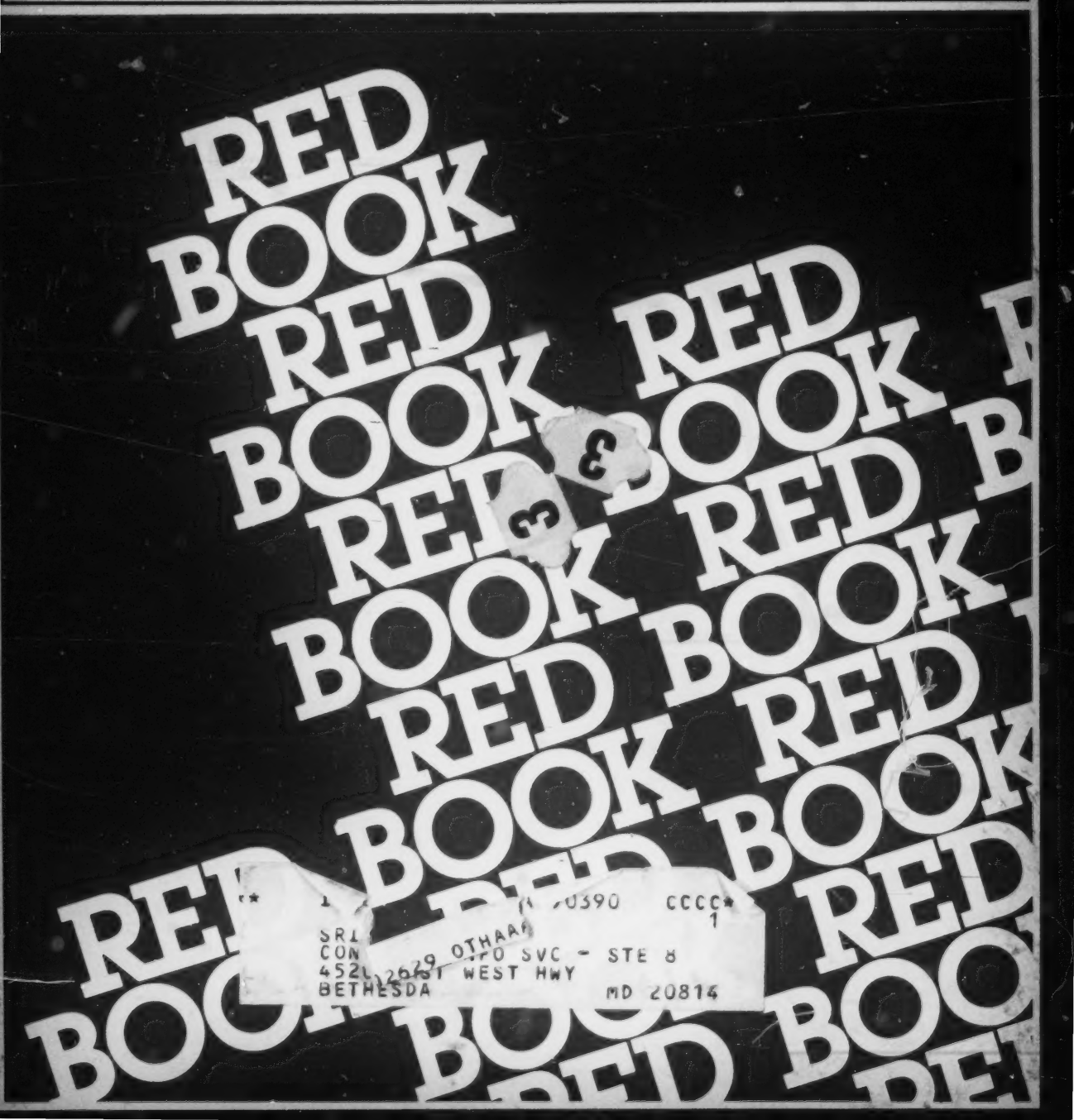
Implement & Tractor

The business magazine of the farm and industrial equipment industry

March 31, 1989



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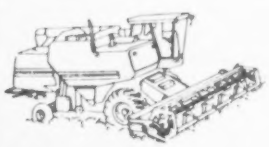

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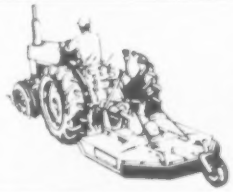

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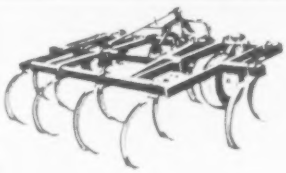

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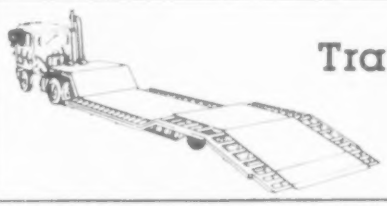

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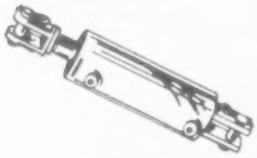

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Abbreviations:
DNA – Does not apply.
NA – Not available.
Std. – Standard.
Opt. – Optional
Linear measurements may be to nearest ¼-inch.

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Ten-Year Summary of Test Reports, 1979-1988

Nebraska Tractor Test Results, normally published in each edition of RED BOOK, are not included in this edition and are replaced by the latest Ten-Year Test Result Summary. An explanation seems in order.

The Nebraska Tractor Test Law originated in 1919 for the purpose of verifying advertising claims on tractors offered for sale to Nebraska farmers. Its previous position as the only independent test laboratory in the U.S. devoted to the evaluation of tractor performance proved of unique value to the industry.

Other nations require third-party testing of tractors, and in the past, several nations with no test program had accepted Nebraska test results. Recently, however, more countries have built their own test facilities or adopted the test procedures of the Organization for Economic Cooperation and Development (OECD). OECD tests are similar to, but not exactly the same, as the SAE/ASAE procedures followed at Nebraska.

Manufacturers generally agree that tractors should be tested in their country of manufacture. For most of them, that would involve tests in Britain, France, Italy, Japan, West Germany and the U.S.

The additional costs associated with duplicate testing have caused some manufacturers to suspend sales of certain models in Nebraska rather than pay the extra cost.

In 1985 industry representatives began an effort to gain recognition for OECD tests in the U.S. The Farm and Industry Equipment Institute (FIEI) was subsequently named the "Designated Authority" for OECD testing. When the FIEI task force began considering possible tractor test organizations other than the University of Nebraska, the Nebraska legislature in early 1986 passed a law to accept results of either the current SAE/ASAE or OECD tractor tests.

Since no Nebraska tests were conducted in 1987 and very few in 1988 and given the ongoing changes and confusion in the current testing procedures, we have decided to forego publishing OECD test results in place of the Nebraska tests until such time an agreement can be reached among the farming and industry communities as to accepted testing procedures.

In lieu of current tests results, we are again publishing the Ten-Year Test Result Summary. This summary includes the most recent data available through the 1988 year and should provide additional, much needed information.

Ten-Year Summary of Test Reports, 1979-1988

MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	ENGINE No. of Cylinders	ENGINE Bore and Stroke	ENGINE Displacement Cu. in.	ENGINE Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Drawbar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	FUEL CONSUMPTION (HP Hours Per Gallon) at:- Max. PTO HP at Std. PTO RPM	PTO Average at Varying Power	—Varying Drawbar Power— Max. Available Power	75% of Pull Max. Power	50% of Pull at Max. Power
Allis-Chalmers																			
6060 8 Speed	1397	Die	8945	2480	4	3.876x4.25	200	2300	63.83	540	64.90	52.24	4.83	6846	16.26	12.07	13.27	11.99	10.10
6070	1545	Die	10515	3055	4	3.875x4.25	200	2300	70.78	540	71.01	59.56	7.90	7997	16.45	12.60	13.38	12.30	10.40
6080 12 Speed	1398	Die	11790	4200	4	3.876x4.25	200	2300	83.66	1000	74.49	72.32	5.74	9003	15.70	13.14	14.27	12.81	10.93
6140	1445	Die	6195	1735	3	3.858x4.055	142	2500	41.08	541	38.04	33.97	5.20	4768	13.47	10.20	10.87	10.25	8.88
7010PD 20 Speed	1345	Die	12790	1530	6	3.875x4.25	301	2300	106.53	1000	107.52	91.44	6.05	9426	15.48	11.57	12.59	11.48	9.68
7010PS 12 Speed	1346	Die	12740	1365	6	3.875x4.25	301	2300	106.72	1000	106.33	91.61	6.11	9516	15.43	11.74	12.43	11.35	9.58
7045 Powershift	1308	Die	18980	4390	6	4.25x5.00	426	2300	146.88	1000	146.67	127.61	6.92	15449	14.92	11.32	12.58	11.71	9.62
8010 Powershift	1446	Die	13185	555	6	3.875x4.25	301	2300	107.38	1000	109.55	93.01	6.16	9102	15.01	11.49	12.57	11.48	9.54
8030 Powershift	1447	Die	17100	2085	6	4.25x5.00	426	2300	133.75	1000	134.42	116.65	6.35	13348	15.25	11.78	12.93	11.87	10.00
8050 Powershift	1448	Die	19380	4075	6	4.25x5.00	426	2300	152.40	1000	155.15	134.13	4.89	16728	15.88	12.51	13.71	12.73	10.80
8070 Powershift	1449	Die	22370	5520	6	4.25x5.00	426	2400	170.72	1000	171.44	147.29	5.87	18777	16.48	12.81	13.67	12.59	10.64
Belarus																			
1500 12 Speed	1333	Die	19885	1120	6	5.118x4.528	558	2100	168.76	1000	169.63	151.96	5.31	19311	16.48	13.69	14.53	13.98	12.25
7100 16 Speed	1334	Die	32460	0	12	5.118x5.512	1360	1900	269.62	1003	269.62	259.46	4.78	30845	15.85	13.26	14.82	14.35	12.56
Big Bud																			
525/50 9 Speed	1400	Die	51920	0	6	5.25x6.25	1150	2100	—	—	—	421.49	5.64	42216			14.87	13.97	12.01
Case																			
1190 Manual	1378	Die	6780	2160	3	3.939x4.500	165	2200	43.09	540	38.54	36.60	7.60	4620	14.99	13.09	12.22	12.59	11.39
1290 Manual	1379	Die	9320	2750	4	3.939x4.000	195	2200	53.73	540	47.80	46.41	4.97	6851	15.20	13.34	12.41	12.90	11.68
1390 Manual	1380	Die	9780	3160	4	3.939x4.500	219	2200	60.59	1000	58.40	52.16	4.92	7348	15.58	13.36	12.89	13.24	11.77
1490 Manual	1381	Die	11305	3600	4	3.939x4.500	219	2200	70.51	1000	68.75	60.45	5.63	8340	17.18	13.62	13.82	13.00	11.25
1490 Powershift	1382	Die	11060	2635	4	3.939x4.500	219	2200	70.91	1000	70.48	61.56	6.76	8405	16.42	12.36	13.12	12.01	10.20
1594 Synchro	1546	Die	11100	1755	6	3.939x4.500	329	2300	85.90	1000	80.83	73.54	5.29	8331	17.04	14.04	14.26	13.56	11.99
1594 Powershift	1547	Die	11210	1745	6	3.939x4.500	329	2300	85.54	1000	81.94	70.59	5.47	8198	16.86	13.52	13.59	13.10	11.45
1690 Manual	1383	Die	12470	3715	6	3.939x4.500	329	2300	90.39	1000	87.76	78.08	4.27	10536	15.95	13.95	13.20	13.50	12.28
1896 Powershift	1548	Die	13925	430	6	4.016x4.724	359	2100	95.92	997	95.92	86.45	4.77	12357	16.71	12.94	14.82	13.65	11.34
2090 Manual	1304	Die	15030	3120	6	4.625x5.000	504	2100	108.74	998	108.74	95.31	7.10	11655	15.40	12.23	13.41	12.69	10.73
2094 Powershift	1525	Die	14750	560	6	4.625x5.000	504	2100	110.50	998	110.50	100.12	6.34	11910	15.40	12.26	13.81	12.93	11.27
2096 Powershift	1549	Die	14940	760	6	4.016x4.724	359	2100	115.67	998	115.67	101.40	6.37	12915	17.38	14.01	15.21	13.92	11.95
2294 Powershift	1526	Die	15670	1280	6	4.625x5.000	504	2100	131.97	998	131.97	116.38	6.31	13017	14.86	11.82	13.11	12.21	10.51
2390 Powershift	1302	Die	18710	3120	6	4.625x5.000	504	2100	160.72	1002	160.72	146.01	6.59	16020	15.23	12.41	13.20	12.66	10.99
2394 Powershift	1527	Die	18595	2355	6	4.625x5.000	504	2100	162.15	1002	162.15	142.07	5.53	15497	15.46	12.70	13.42	12.71	11.04
2590 Powershift	1303	Die	20500	4760	6	4.625x5.000	504	2100	180.38	1003	180.38	159.01	6.57	17865	15.53	12.97	13.42	13.03	11.67
2594 Powershift	1529	Die	19790	3570	6	4.625x5.000	504	2100	182.07	1002	182.07	161.96	6.40	16874	15.22	12.88	13.37	12.94	11.63
3294 Powershift	1528	Die	17980	0	6	4.625x5.000	504	2100	162.63	998	162.63	143.68	5.75	16242	15.32	12.58	13.55	12.76	11.13
4490	1328	Die	22450	1610	6	4.625x5.000	504	2200	175.20	1000	175.20	153.30	5.65	21400	15.27	12.36	13.30	12.52	10.87
4690	1329	Die	25230	2920	6	4.625x5.000	504	2200	219.62	1000	219.62	195.60	5.97	24564	15.26	12.76	13.39	12.84	11.21
4890	1330	Die	28460	2710	6	5.00x5.71	673	2200	253.41	1000	253.41	224.81	5.96	27627	16.32	13.02	14.19	13.27	11.36
4994 Powershift	1530	Die	39930	8615	8	5.00x5.51	866	2100	344.04	991	344.04	306.43	7.20	34519	17.03	13.81	14.67	13.87	12.18
Case IH																			
685	1604	Die	8845	3010	4	3.875x5.06	239	2400	61.02	540	58.80	54.63	5.42	7207	14.76	11.56	12.66	11.86	9.95
2394 Powershift	1582	Die	18630	2230	6	4.675x5.00	504	2100	162.92	1002	162.92	148.98	5.12	17425	15.81	13.02	14.36	13.56	11.89
3394 Powershift	1583	Die	18610	2810	6	4.625x5.00	504	2100	162.86	1002	162.86	144.82	5.08	17421	15.39	12.59	13.51	12.48	10.55
3594 Powershift	1584	Die	20500	2910	6	4.625x5.00	504	2100	182.27	1002	182.27	165.12	5.07	20384	15.45	13.05	13.70	12.91	11.20
John Deere																			
750 8 Speed	1504	Die	2150	155	3	3.15x3.35	78.2	2400	18.54	540	19.80	15.73	6.41	1661	15.06	11.61	12.48	11.53	9.83
1050	1327	Die	4140	730	3	3.54x3.54	105	2400	33.41	540	33.42	28.15	5.27	3466	15.46	12.36	12.34	11.99	10.13

Ten-Year Summary of Test Reports, 1979-1988

MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	ENGINE No. of Cylinders	Bore and Stroke	Displacement Cu. in.	Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Drawbar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP at Std. PTO RPM	FUEL CONSUMPTION (HP Hours Per Gallon) at:- PTO Average at Varying Power	—Varying Drawbar Power— Max. Available Power	75% of Pull Max. Power	50% of Pull at Max. Power
1250	1437	Die	5180	90	3	3.74x4.33	143	2500	40.70	540	40.98	34.01	5.39	3750	17.00	13.56	13.90	12.71	10.68
1450 9 Speed	1505	Die	6570	1340	4	3.74x4.33	190	2400	51.39	540	50.93	43.79	7.68	5321	17.60	14.01	14.74	13.67	11.64
1650 9 Speed	1506	Die	7785	2435	4	3.74x4.33	190	2300	62.22	540	62.70	54.06	7.79	6572	18.81	15.53	15.96	14.97	12.95
2040 8 Speed	1350	Die	6500	1465	3	4.19x4.33	179	2500	41.25	540	40.53	33.31	5.63	4873	15.62	11.73	12.02	11.35	9.03
2040 8 Speed TSS (1)	1393	Die	6040	265	3	4.19x4.33	179	2500	40.44	540	40.22	33.21	5.16	5541	14.87	10.93	11.69	10.71	8.76
2150 16 Speed	1469	Die	5930	820	3	4.19x4.33	179	2500	46.47	540	46.13	38.69	6.98	4875	14.77	11.15	11.88	11.24	9.47
2240 8 Speed TSS (1)	1394	Die	6205	310	3	4.19x4.33	179	2500	50.90	540	49.20	42.13	5.08	5777	15.32	11.75	11.98	11.45	9.78
2350 16 Speed	1470	Die	7190	380	4	4.19x4.33	239	2500	56.18	540	55.69	47.53	6.77	5688	15.67	11.66	12.96	11.87	9.87
2550 16 Speed	1471	Die	8485	1575	4	4.19x4.33	239	2500	65.94	540	65.53	56.24	6.22	6979	15.42	11.85	12.83	12.09	10.10
2750 16 Speed	1472	Die	9625	2125	4	4.19x4.33	239	2500	75.35	540	75.07	63.98	4.75	7581	16.11	12.29	13.13	12.37	10.51
2755	1605	Die	9715	1170	4	4.19x4.33	239	2300	76.57	1000	77.63	66.05	5.18	7498	17.82	14.04	14.87	14.19	12.14
2940 16 Speed	1351	Die	10650	1215	6	4.19x4.33	359	2500	81.17	1000	81.46	67.98	4.64	7601	15.91	11.73	12.81	11.91	9.91
2950 16 Speed	1473	Die	11045	945	6	4.19x4.33	359	2500	85.37	1000	85.50	73.30	6.57	8768	16.33	12.21	13.58	12.45	10.53
2955	1606	Die	11150	130	6	4.19x4.33	359	2300	86.22	1000	85.54	74.20	5.42	9971	17.41	13.63	14.82	13.79	11.64
3150	1589	Die	12300	355	6	4.19x4.33	359	2400	96.06	997	96.06	83.04	5.64	10507	16.45	13.09	14.23	13.34	11.21
4040 Syncro Range	1359	Die	12090	1600	6	4.25x4.75	404	2200	90.31	1002	90.31	77.04	8.14	9035	13.87	10.85	11.68	11.29	9.70
4040 Powershift	1360	Die	12080	1590	6	4.25x4.75	404	2200	90.79	1000	90.88	78.54	4.45	9195	13.54	10.79	11.50	11.35	9.55
4050 Quad	1474	Die	13005	835	6	4.57x4.75	466	2200	101.49	1002	101.49	92.05	6.49	10331	15.12	11.72	13.44	12.54	10.64
4050 Quadrange	1590	Die	13670	1280	6	4.19x4.33	359	2200	105.89	1003	105.89	96.35	5.86	11381	17.23	13.60	15.34	14.25	12.13
4050 Powershift	1457	Die	13030	310	6	4.57x4.75	466	2200	100.95	1002	100.95	88.75	7.88	11058	15.08	11.59	12.60	11.69	9.65
4050 Powershift	1591	Die	13685	1000	6	4.19x4.33	359	2200	105.69	1003	105.69	91.64	8.51	11378	17.40	13.78	14.61	13.47	10.99
4240 Syncro Range	1361	Die	14240	2430	6	4.56x4.75	466	2200	110.81	1002	110.81	95.40	4.90	12240	14.17	11.08	12.00	11.47	9.81
4240 Powershift	1362	Die	14260	2440	6	4.56x4.75	466	2200	111.06	1000	111.43	95.65	4.51	12450	14.39	11.25	12.13	11.65	10.13
4250 Quad	1475	Die	14990	1620	6	4.57x4.75	466	2200	120.21	1002	120.21	108.77	5.71	12858	15.70	12.21	13.90	12.82	10.64
4250 Powershift	1458	Die	14970	1115	6	4.57x4.75	466	2200	120.86	1002	120.86	105.11	8.36	12802	15.78	12.33	13.44	12.08	10.17
4440 Powershift	1357	Die	15775	2655	6	4.57x4.75	466	2200	130.41	1010	130.41	114.16	4.53	13738	15.32	11.83	13.15	12.22	10.60
4450 Quad	1476	Die	16680	2380	6	4.57x4.75	466	2200	140.33	1002	140.33	125.18	5.01	15069	16.36	13.08	14.42	13.45	11.61
4450 Quad (2)	1476	Die	16760	2005	6	4.57x4.75	466	2200	140.33	1002	140.33	126.34	5.37	16278	16.36	13.08	14.68	—	—
4450 Powershift	1459	Die	16745	1795	6	4.57x4.75	466	2200	140.43	1002	140.43	121.94	8.03	15014	16.15	12.94	13.63	12.58	10.60
4450 Powershift (2)	1459	Die	16625	1225	6	4.57x4.75	466	2200	140.43	1002	140.43	122.51	8.58	16154	16.15	12.94	13.66	—	—
4640 Powershift	1358	Die	18585	2805	6	4.57x4.75	466	2200	155.96	1000	157.01	137.04	4.81	15989	15.87	12.17	13.53	12.55	10.78
4650 Quad	1477	Die	19615	1615	6	4.57x4.75	466	2200	165.70	998	165.70	145.58	6.45	16814	16.99	13.90	14.80	13.81	12.11
4650 Quad (2)	1477	Die	19590	1150	6	4.57x4.75	466	2200	165.70	998	165.70	147.71	5.73	18931	16.99	13.90	14.93	—	—
4650 Powershift	1460	Die	19660	1075	6	4.57x4.75	466	2200	165.52	998	165.52	143.33	8.12	16746	16.96	13.78	14.25	13.15	11.31
4650 Powershift (2)	1460	Die	19740	695	6	4.57x4.75	466	2200	165.52	998	165.52	146.06	8.47	18794	16.96	13.78	14.44	—	—
4850 Powershift	1461	Die	21435	2715	6	4.57x4.75	466	2200	192.99	998	192.99	171.27	8.04	18789	17.47	14.50	14.68	13.80	12.01
4850 Powershift (2)	1461	Die	21440	2280	6	4.57x4.75	466	2200	192.99	998	192.99	172.60	4.26	20810	17.47	14.50	14.93	—	—
8440	1323	Die	26590	0	6	4.57x4.75	466	2100	179.83	993	179.83	163.26	4.97	25383	15.86	12.55	14.29	13.06	11.25
8450	1436	Die	29150	0	6	4.57x4.75	466	2100	186.98	993	186.98	175.73	4.50	26567	15.69	12.91	14.45	13.53	11.63
8640	1324	Die	28270	0	6	5.125x5.00	619	2100	228.75	993	228.75	208.38	4.63	27782	15.61	12.40	14.06	13.14	11.16
8650	1435	Die	30270	0	6	5.125x5.00	619	2100	238.56	993	238.56	221.80	5.55	28257	15.53	12.65	14.26	13.22	11.52
8850	1434	Die	37700	0	8	5.51x5.00	955	2100	303.99	996	303.99	274.25	5.23	35330	15.74	12.82	14.06	13.34	11.65
(1) With mechanical front wheel drive. (2) Supplementary test with radial ply tires.																			
Deutz																			
DX 90	1305	Die	13150	3210	5	3.94x4.72	287	2300	84.47	1000	80.82	74.19	6.53	8786	16.45	14.15	13.81	14.07	12.39
DX 110	1306	Die	14940	2360	6	3.94x4.72	345	2300	100.29	1000	93.61	90.82	7.00	11773	15.10	13.71	13.52	14.03	12.60
DX 120	1405	Die	14950	1980	6	4.02x4.92	374	2400	111.29	1000	101.90	97.41	7.32	12615	16.40	13.84	13.59	13.48	12.03
DX 130	1404	Die	17630	3690	6	4.02x4.92	374	2300	121.27	1000	121.36	105.63	4.76	14406	17.63	13.77	14.14	13.10	11.26
DX 160	1307	Die	18710	3870	6	4.02x4.92	374	2200	145.41	1000	140.99	124.81	6.41	15172	17.82	14.47	14.56	13.95	11.93
Deutz Allis																			
6260	1574	Die	8790	1530	3	4.02x4.92	187	2500	57.09	540	55.35	50.73	4.60	7270	15.47	13.20	12.95	13.46	11.63
7085	1575	Die	13660	3580	4	4.02x4.92	249	2300	85.18	1000	84.35	75.13	7.56	10502	16.89	14.03	14.40	13.76	12.00
7120	1576	Die	17595	5465	6	4.02x4.92	374	2300	122.06	1000	123.15	105.49	5.06	13633	17.15	13.63	14.20	12.98	11.36
Deutz Fahr																			
DX 3.50	1574	Die	8790	1530	3	4.02x4.92	187	2500	57.09	540	55.35	50.73	4.60	7270	15.47	13.20	12.95	13.46	11.63
DX 4.70	1575	Die	13660	3580	4	4.02x4.92	249	2300	85.18	1000	84.35	75.13	7.56	10502	17.15	13.63	14.20	12.98	11.36
DX 6.50	1576	Die	17595	5465	6	4.02x4.92	374	2300	122.06	1000	123.15	105.49	5.06	10734	16.89	14.03	14.40	13.76	12.00

Ten-Year Summary of Test Reports, 1979-1988

MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	ENGINE No. of Cylinders	Bore and Stroke	Displacement Cu. in.	Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Drawbar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	FUEL CONSUMPTION (HP Hours Per Gallon) at:- Max. PTO HP at Std. PTO RPM	PTO Average at Varying Power	—Varying Drawbar Power— Max. Available Power	75% of Pull Max. Power	50% of Pull at Max. Power
Ford																			
1510 (12x4) Manual	1500	Die.	3205	975	3	3.03x3.15	68.2	2800	19.72	540	20.45	16.99	6.92	1952	13.21	10.32	11.14	10.26	8.50
1510 (12x4) Synchro	1501	Die.	3200	915	3	3.03x3.15	68.2	2800	19.98	540	18.68	16.83	6.70	1900	13.50	10.29	10.97	10.27	8.57
1700	1325	Die.	3725	1110	2	3.54x3.94	77.6	2500	23.26	540	23.02	20.21	5.54	2801	13.02	11.21	10.89	11.48	10.41
1710 (12x4) Manual	1502	Die.	3510	1040	3	3.31x3.31	85.2	2700	23.88	540	22.19	21.02	7.06	2700	13.42	10.16	11.36	10.76	8.98
1710 (12x4) Synchro	1503	Die.	3530	1060	3	3.31x3.31	85.2	2700	23.79	540	22.34	21.23	5.68	3680	13.18	9.92	11.04	10.56	8.81
1900	1326	Die.	4160	1225	3	3.35x3.31	87.2	2800	26.88	540	25.68	23.49	6.20	2964	12.58	10.38	10.41	10.89	9.32
1910 (12x4) Manual	1507	Die.	4250	1270	3	3.346x3.937	103.9	2500	28.60	540	28.29	25.57	6.78	3340	12.94	10.32	11.14	10.86	9.17
1910 (12x4) Synchro	1508	Die.	4325	1285	3	3.346x3.937	103.9	2500	28.52	540	28.30	25.62	6.79	3449	12.48	10.36	10.99	10.78	9.09
2110 (12x4) Manual	1509	Die.	5105	1470	4	3.346x3.937	138.5	2500	34.79	540	34.91	30.80	7.01	3868	14.01	10.69	11.80	10.95	9.04
2110 (12x4) Synchro	1510	Die.	5110	1450	4	3.346x3.937	138.5	2500	35.11	540	35.56	31.11	6.99	3728	14.01	10.71	11.77	11.11	9.35
2610 (8x2)	1421	Die.	5940	1780	3	4.20x4.20	175	2000	36.69	540	35.14	31.45	5.52	4473	16.15	12.82	13.03	12.71	10.51
2810	1573	Die.	5935	1295	3	4.20x3.80	158	2000	32.83	540	31.82	29.14	5.88	4036	15.20	11.57	12.88	11.99	9.96
2910 (8x2)	1491	Die.	5925	1295	3	4.20x4.20	175	2000	36.62	540	35.09	30.45	5.77	4237	16.04	12.51	13.18	12.31	10.49
2910 (8x4)	1492	Die.	5955	1305	3	4.20x4.20	175	2000	36.40	540	34.75	31.03	5.68	4223	15.95	12.58	13.00	12.24	10.59
3610 (8x2)	1422	Die.	6340	2070	3	4.40x4.20	192	2000	42.26	540	40.17	36.80	5.85	4964	15.95	12.65	13.37	12.69	11.20
3610 (8x4)	1423	Die.	6340	2045	3	4.40x4.20	192	2000	42.47	540	40.01	35.57	8.55	4917	16.26	12.94	12.85	12.44	10.53
3910 (8x2)	1493	Die.	6440	1760	3	4.40x4.20	192	2000	42.62	540	40.39	37.02	5.93	4931	15.86	12.48	13.33	12.66	10.71
3910 (8x4)	1494	Die.	6435	1735	3	4.40x4.20	192	2000	42.67	540	41.16	36.22	5.85	4934	15.64	12.63	13.16	12.34	10.59
4110 (8x2)	1424	Die.	7500	2850	3	4.40x4.40	201	2200	48.33	540	42.65	41.25	4.51	5681	16.37	12.64	13.26	12.34	10.76
4110 (8x4)	1425	Die.	7500	2785	3	4.40x4.40	201	2200	49.26	540	44.06	40.59	4.92	5691	16.06	12.32	12.92	12.13	10.44
4610 (8x2)	1426	Die.	8190	3095	3	4.40x4.40	201	2200	52.52	540	46.72	44.51	5.17	6402	16.78	13.17	13.96	13.25	11.60
4610 (8x4)	1427	Die.	8230	3085	3	4.40x4.40	201	2200	52.32	540	47.30	43.26	5.62	6534	16.83	13.05	13.53	12.77	11.18
5610 (16x4)	1428	Die.	9700	2325	4	4.40x4.20	256	2100	62.54	540	60.58	54.63	5.69	7408	15.57	12.38	12.82	12.44	10.30
5610 (16x8)	1429	Die.	9545	3130	4	4.40x4.20	256	2100	62.57	540	59.99	53.70	6.57	7578	15.45	12.11	12.93	12.03	10.09
6610 (16x4)	1430	Die.	9700	2270	4	4.40x4.40	268	2100	72.13	540	68.27	61.17	5.62	7887	15.64	13.14	13.40	12.90	10.77
6610 (16x8)	1431	Die.	9700	2850	4	4.40x4.40	268	2100	72.30	540	69.20	62.64	6.49	7948	15.43	12.91	13.18	12.84	10.87
7610 (16x4)	1432	Die.	10800	2220	4	4.40x4.40	268	2100	86.95	1000	86.79	74.22	5.53	8804	15.75	12.44	13.36	12.29	10.35
7710 (16x8)	1433	Die.	10800	2150	4	4.40x4.40	268	2100	86.62	1000	86.55	73.24	6.42	8638	15.87	12.60	13.67	12.26	10.35
TW-5	1514	Die.	14430	1340	6	4.40x4.40	401	2300	105.74	1000	96.83	95.27	8.52	12249	15.52	12.42	13.14	12.91	11.38
TW-10	1301	Die.	15190	2325	6	4.40x4.40	401	2300	110.24	1000	101.09	97.35	5.23	12006	14.86	11.50	12.17	11.91	10.20
TW-15	1515	Die.	16010	2755	6	4.40x4.40	401	2200	121.40	1000	117.83	107.24	8.09	13247	16.90	12.39	13.83	12.80	10.88
TW-15 FWD (2)	1536	Die.	16680	2310	6	4.40x4.40	401	2200	121.25	1000	115.58	107.35	5.21	15939	16.95	12.39	13.96	12.65	10.68
TW-20	1300	Die.	17180	3945	6	4.40x4.40	401	2200	135.60	1000	131.43	121.47	7.85	14155	16.22	11.78	13.08	12.04	10.09
TW-25	1516	Die.	17965	2530	6	4.40x4.40	401	2200	146.68	1000	135.70	126.73	5.25	14871	16.66	12.58	13.89	13.02	11.20
TW-30	1299	Die.	19830	5205	6	4.40x4.40	401	2200	163.28	1000	157.04	144.17	8.32	16553	16.76	12.49	13.67	12.58	10.79
TW-35	1517	Die.	20270	4090	6	4.40x4.40	401	2200	170.30	1000	166.67	147.49	5.30	17054	17.41	13.81	14.31	13.91	12.18
TW-35 FWD (2)	1537	Die.	20270	3130	6	4.40x4.40	401	2200	171.12	1000	162.55	147.55	5.44	18823	17.58	14.09	14.42	13.71	12.04
(1) Equipped with controlled, hydrostatic pto with 105 output horsepower at 1000 rpm (2) Drawbar test with front wheel assist engaged.																			
Hesston Fiat																			
466 12 Speed	1484	Die.	6670	950	3	3.94x4.33	158	2600	45.13	540	42.68	40.03	5.79	4969	16.74	12.41	13.66	12.87	10.95
480-8 DT and 480-8 12 & 8 Speed	1385	Die.	7805	2485	3	3.937x4.33	158	2600	42.58	540	40.36	37.07	5.07	5265	16.93	12.27	13.34	12.54	10.64
45-66DT	1579	Die.	5400	950	3	3.937x4.528	165	2500	39.49	540	37.97	31.74	4.68	4257	16.65	12.11	12.36	11.23	9.46
55-66DT	1560	Die.	6570	1105	3	3.937x4.528	165	2500	45.78	540	44.84	38.74	5.64	4608	16.36	12.77	12.98	12.80	11.27
60-66 DT	1531	Die.	7460	1580	3	4.094x4.527	178.8	2500	51.49	540	48.51	45.51	5.53	5515	17.13	13.11	14.19	13.30	11.38
70-66DT	1561	Die.	8705	2015	4	3.937x4.528	220.5	2500	62.72	1000	62.71	54.83	5.69	8320	17.20	13.67	14.64	13.61	11.54
70-90	1562	Die.	7775	490	4	3.937x4.527	220.5	2500	62.25	1000	61.94	54.64	5.62	6238	16.52	13.28	14.04	13.46	11.82
80-90	1563	Die.	9465	2155	4	4.094x4.527	238.5	2500	70.86	1000	69.25	61.52	5.56	7323	17.43	13.96	14.76	14.09	12.28

100 90	1580	Die	11580	1860	6	3.937x4.527	331	2500	91.52	1000	90.57	78.72	6.35	9911	16.24	12.93	13.62	12.76	10.68
666 12 Speed	1485	Die	8715	2425	4	3.937x4.33	211	2500	62.40	540	60.33	54.31	5.51	6611	17.00	13.00	13.79	13.20	11.73
680DT & 680 8 Speed	1352	Die	10000	2660	4	3.937x4.33	211	2500	62.47	1000	61.20	53.65	5.44	6252	17.40	14.19	14.80	14.20	12.45
780 DT and																			
780 8 Speed	1396	Die	10100	3920	4	4.055x4.33	224	2500	70.57	540	66.67	62.06	7.61	6965	16.71	13.96	13.72	13.86	12.26
80 66 DT	1532	Die	9400	2685	4	4.094x4.527	238.5	2500	70.43	1000	68.91	62.73	5.47	7245	17.22	14.08	14.96	14.21	12.66
880 DT 5 &																			
880 5 12 Speed	1352	Die	11560	2810	5	4.055x4.331	280	2500	81.32	1000	80.95	70.73	7.63	7554	16.27	13.23	13.50	13.44	11.65
980DT & 980 16 Speed	1354	Die	12645	3795	6	3.937x4.33	316	2400	91.12	996	91.12	77.42	5.00	8351	16.90	13.92	14.25	13.59	12.25
1180 DT Turbo	1450	Die	16885	1935	6	4.055x4.33	335	2550	107.48	1000	104.22	93.71	4.37	12905	16.40	12.54	14.16	12.74	10.42
1380DT, 1380	1409	Die	16995	1795	6	4.055x4.33	335	2400	123.16	1000	123.54	104.97	8.08	13105	16.49	13.30	13.60	13.01	11.62
130 90DT Turbo	1564	Die	16385	660	6	4.094x4.527	358	2500	107.48	1000	106.80	91.59	4.67	19850	16.43	12.07	13.83	12.17	9.85
140 90 DT Turbo	1533	Die	16425	375	6	4.094x4.527	358	2500	123.35	1000	122.83	105.81	5.05	12687	17.12	13.04	14.40	13.16	11.13
1580DT Turbo	1451	Die	19060	2460	6	4.528x5.118	494	2200	141.44	1000	136.14	124.15	5.48	15342	17.28	13.49	14.70	13.53	11.47
160 90 DT Turbo	1534	Die	18370	1075	6	4.528x5.118	494	2200	141.71	1000	143.91	122.23	5.32	13848	17.53	13.61	14.38	13.62	11.84
160 90 Powershift	1603	Die	18220	300	6	4.528x5.118	494	2200	142.64	1000	141.40	126.34	4.44	18256	16.69	12.96	13.92	12.93	11.10
1880DT, 1880	1410	Die	19710	3020	6	4.528x5.118	494	2200	162.48	1000	159.83	138.81	5.44	15656	17.35	13.87	14.53	13.58	12.07
180 90 DT Turbo	1535	Die	19725	2430	6	4.528x5.118	494	2200	162.87	1000	158.66	140.45	6.40	14713	17.86	14.13	14.82	14.25	12.29
180 90 Turbo P.S.	1581	Die	19570	1745	6	4.528x5.118	494	2200	162.15	1000	161.07	143.02	4.43	19734	16.77	13.07	14.03	13.30	11.06
International Harvester																			
Hydro 84	1316	Die	9120	3115	4	3.937x5.062	246	2400	58.73	540	56.68	43.59	7.60	6572	14.01	10.50	10.13	9.82	8.34
Hydro 86	1337	Die	10710	2545	6	3.875x4.375	310	2400	70.89	540	66.64	54.10	4.03	8815	14.18	10.23	9.92	9.55	8.24
284 8 Speed	1387	Die	3600	860	3	3.27x3.94	99	2600	27.47	540	23.92	23.52	5.71	2523	14.40	10.91	10.99	10.53	9.18
484 Utility	1312	Die	7710	2710	3	3.875x5.06	179	2200	42.42	540	41.79	38.06	4.78	5500	14.81	11.85	12.75	12.39	10.63
584 Utility & Rowcrop	1313	Die	8850	3185	4	3.875x4.38	206	2300	52.54	540	50.96	47.47	5.07	6859	15.23	12.34	13.41	12.95	11.10
684 Utility & Rowcrop	1314	Die	9660	3825	4	3.875x5.06	239	2400	62.52	540	58.75	55.92	5.29	6858	15.55	12.21	13.27	13.02	11.28
686 10 Speed	1336	Die	10340	2360	6	3.875x4.375	310	2000	66.36	543	66.36	58.81	5.08	8043	16.07	13.16	13.93	13.27	11.53
784 Rowcrop	1315	Die	9920	3830	4	3.937x5.062	246	2400	67.48	1000	64.09	58.65	5.18	8105	16.06	12.75	13.25	12.77	11.07
786 16 Speed	1388	Die	11930	340	6	3.875x5.0625	358	2400	80.20	1000	77.41	70.25	4.74	9968	15.72	11.40	12.72	11.88	10.00
884 Rowcrop	1376	Die	10150	3945	4	3.937x5.51	268	2400	72.91	1000	69.76	65.39	5.54	8116	15.76	12.47	13.48	12.91	11.05
886 16 Speed	1338	Die	13450	1710	6	3.875x5.063	358	2400	86.57	1000	83.91	76.25	4.69	10807	16.01	11.77	12.97	12.21	10.62
886 16 Speed (1)	1339	Die	13450	1710	6	3.875x5.063	358	2400	90.56	1000	88.23	80.13	4.69	10930	15.84	11.98	12.81	12.38	10.86
(1) Serial No. 2490208 U17026 and up.																			
3088 16 Speed	1551	Die	12500	560	6	3.875x5.062	358	2400	81.35	1000	80.28	71.20	5.16	10995	16.03	11.36	12.84	11.59	9.76
3288	1438	Die	13560	1800	6	3.875x5.062	358	2400	90.46	1000	88.33	80.72	6.11	11486	15.94	11.69	13.16	12.31	10.27
3388	1319	Die	17850	430	6	4.30x5.00	436	2400	130.61	1000	128.59	114.42	6.67	16764	16.85	12.00	13.52	12.17	10.09
3488 Hydro	1439	Die	13940	1060	6	4.30x5.35	466	2400	112.56	1000	107.11	83.43	6.50	12152	15.28	10.64	10.00	9.73	8.43
3588	1320	Die	18890	1270	6	4.30x5.35	466	2400	150.41	1000	152.07	130.94	6.65	17589	16.98	12.19	13.13	12.20	10.30
3688	1440	Die	14335	1135	6	4.30x5.00	436	2400	113.72	1000	112.48	100.28	7.36	12250	15.75	11.82	13.30	12.35	10.38
3788 12 Speed	1377	Die	20820	2200	6	4.30x5.35	466	2500	170.57	1000	166.39	146.43	7.49	19069	17.12	12.22	13.24	12.25	10.06
4786	1317	Die	34350	4150	8	5.31x4.50	798	2600	...	...	...	265.55	4.79	33468	...	...	12.80	11.92	9.86
5088 (2)	1419	Die	16250	240	6	4.30x5.00	436	2400	136.12	1005	136.12	121.17	5.06	14960	15.32	11.65	13.23	12.04	9.90
5288	1420	Die	18585	1530	6	4.30x5.35	466	2400	162.60	1005	162.60	142.37	5.27	17577	16.07	12.62	13.70	12.77	10.75
5488	1441	Die	20005	2765	6	4.30x5.35	466	2400	187.22	1005	187.22	164.82	5.27	18646	16.20	13.00	14.16	13.15	11.21
(2) Drawbar information is from test run with radial ply tires.																			
Kubota																			
L235	1406	Die	3715	1280	3	3.00x3.23	68	2600	19.59	540	19.63	16.05	4.68	2440	14.33	11.34	11.33	10.85	9.23
L275	1407	Die	4055	1430	3	3.23x3.23	79.3	2600	23.42	540	23.01	19.70	4.84	2717	14.57	11.55	11.62	11.07	9.95
L295DT and																			
L295 8 Speed	1370	Die	4700	1805	3	3.23x3.23	79.3	2800	26.46	540	24.91	22.82	4.34	3155	14.59	11.75	11.57	11.39	9.58
L305DT and																			
L305 8 Speed	1371	Die	5360	2070	3	3.23x3.23	79.3	2800	26.21	540	25.14	22.96	4.16	3918	13.83	11.14	11.15	11.13	9.46
L345DT and																			
L345 8 Speed	1372	Die	5435	2000	4	3.00x3.23	90.7	2800	29.35	540	28.80	26.72	4.62	3795	12.76	10.58	10.68	10.81	9.15
L2250 4WD	1585	Die	3130	530	3	3.23x3.23	79.3	2600	21.15	540	21.45	17.28	5.04	2103	17.18	13.38	13.46	12.36	10.67
L2550 4WD	1586	Die	3850	1100	3	3.35x3.23	85.1	2600	23.98	541	24.24	20.23	5.22	2446	16.52	13.37	13.27	12.39	10.55
L2850 4WD	1587	Die	4580	1615	4	3.23x3.23	105.7	2600	27.51	540	27.96	24.02	5.02	3143	16.98	13.07	13.49	12.68	10.92
L3350 4WD	1588	Die	5340	1155	4	3.35x3.23	113.6	2600	32.86	540	33.29	27.49	4.92	3434	17.13	13.52	13.32	12.78	11.08
L3750 4WD	1555	Die	5945	1530	5	3.35x3.23	142	2500	36.96	540	36.81	30.69	4.96	3641	16.56	13.32	13.29	12.49	10.69
L4150 4WD	1556	Die	6365	1840	5	3.35x3.23	142	2600	40.64	540	40.22	34.50	5.47	4257	17.12	13.24	13.14	12.81	11.07

Ten-Year Summary of Test Reports, 1979-1988

MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	ENGINE No. of Cylinders	ENGINE Bore and Stroke	ENGINE Displacement Cu. in.	ENGINE Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Drawbar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP at Std. PTO RPM	FUEL CONSUMPTION (HP Hours Per Gallon) at:- PTO Average at Varying Power	—Varying Drawbar Power— Max. Available Power	75% of Pull Max. Power	50% of Pull at Max. Power
M4030DT	1594	Die.	7375	2415	6	3.23x3.23	158.5	2600	44.05	540	44.08	36.91	6.02	4005	17.19	13.48	13.80	12.92	11.16
M4050DT and M4050 8 Speed	1495	Die.	7215	2275	6	3.23x3.23	158.5	2600	45.74	540	42.10	37.61	5.99	4259	15.06	11.57	11.67	11.52	9.88
M4500DT & M4500 16 Speed	1348	Die.	7800	2635	6	3.23x3.23	158.5	2600	49.72	540	44.49	42.50	6.16	4812	15.19	12.22	11.90	12.02	10.77
M4950DT & M4950 12 Speed	1496	Die.	8195	2395	6	3.35x3.23	170	2600	49.57	540	45.47	41.43	4.68	5292	14.70	11.21	11.49	11.15	9.26
M5030DT	1595	Die.	8120	2985	6	3.35x3.23	170	2600	49.77	540	48.94	42.00	4.90	4592	17.28	13.58	13.72	13.34	11.67
M5500DT and M5500 16 Speed	1369	Die.	8710	3210	3	4.134x4.528	182	2400	53.99	540	49.18	46.96	5.51	6287	16.22	12.44	13.05	12.77	11.05
M5950DT & M5950 12 Speed	1497	Die.	9220	3100	3	4.29x4.53	196	2400	58.00	540	52.81	49.29	5.09	5749	17.08	13.44	13.64	13.53	11.83
M6030DT	1596	Die.	8970	3590	3	4.29x4.53	196	2400	57.74	540	53.57	48.11	5.54	5330	16.96	13.32	13.28	13.32	11.68
M6950DT & M6950 12 Speed	1498	Die.	9575	2530	4	4.13x4.53	243	2400	66.44	540	63.96	56.74	5.02	6517	16.98	13.26	13.72	13.28	11.33
M7030DT	1597	Die.	9405	3205	4	4.13x4.53	243	2400	68.87	540	64.38	58.49	5.23	5896	17.43	13.68	14.03	13.80	11.97
M7500DT & M7500 16 Speed	1349	Die.	9510	3530	4	4.13x4.53	242	2400	72.34	540	66.54	61.29	6.65	6327	17.83	14.15	13.93	14.20	12.40
M7950DT & M7950 12 Speed	1499	Die.	10305	3205	4	4.29x4.53	262	2400	75.44	540	69.32	65.24	5.26	7244	17.14	13.57	13.88	13.82	11.93
M8030DT	1598	Die.	9970	3640	4	4.29x4.53	262	2400	76.91	540	70.47	64.37	6.97	6503	17.23	13.71	13.70	13.54	11.95
M8950DT	1557	Die.	12270	2540	4	4.29x4.53	262	2400	85.63	1005	85.63	71.13	7.53	7974	16.21	12.91	12.96	12.37	10.36
Leyland																			
472 & 272 9 Speed	1341	Die.	11990	4580	4	3.858x4.921	230	2200	63.52	540	58.50	53.27	5.91	7224	14.97	12.28	11.32	11.67	10.48
482 & 282 9 Speed	1340	Die.	12000	4590	4	3.858x4.921	230	2200	74.28	540	70.86	61.19	5.86	7032	17.58	12.63	12.70	12.10	10.09
Long																			
360	1298	Die.	6410	1930	3	3.74x4.33	143	2400	36.16	540	31.06	31.91	5.20	4808	14.41	11.97	12.45	12.13	10.48
510	1415	Die.	8210	3925	3	4.02x4.33	164.5	2400	49.15	540	46.91	43.27	5.14	6040	15.74	13.48	13.15	13.52	12.24
510DTC	1416	Die.	9100	3835	3	4.02x4.33	164.5	2400	49.35	540	46.41	41.37	4.63	5635	16.47	13.72	13.68	13.30	11.69
610	1417	Die.	8985	4290	4	4.02x4.33	219	2400	64.33	540	60.57	57.48	5.37	7018	15.93	13.46	13.58	13.51	11.92
Massey-Ferguson																			
MF154-4	1411	Die.	6920	1615	3	3.60x5.00	152	2250	42.52	540	40.38	35.40	4.52	4144	17.26	13.41	13.79	13.00	11.42
MF184-4 12 Speed	1392	Die.	7775	1395	4	3.875x5.00	236	2200	62.45	540	59.56	52.38	7.13	5500	16.41	12.37	12.61	12.11	10.69
MF205 6 Speed	1363	Die.	2840	935	2	3.46x3.46	65.2	2400	16.56	540	16.34	13.45	4.39	1995	12.97	9.62	9.98	9.65	8.03
MF205-4 6 Speed	1364	Die.	3120	905	2	3.46x3.46	65.2	2400	16.40	540	16.18	13.57	4.86	2131	12.83	9.69	10.04	9.57	8.02
MF210 12 Speed	1365	Die.	3550	1090	2	3.62x3.74	77.1	2500	21.96	540	21.23	18.08	5.81	2159	13.61	11.04	10.84	10.53	9.36
MF210-4 12 Speed	1366	Die.	3765	1030	2	3.62x3.74	77.1	2500	21.77	540	21.02	17.60	6.91	2158	13.18	10.75	9.97	10.44	8.61
MF220 12 Speed	1367	Die.	4220	1455	2	3.82x3.94	90.3	2500	26.37	540	25.52	23.95	4.34	3287	13.36	11.07	11.22	11.60	10.17
MF220-4 12 Speed	1368	Die.	4487	1307	2	3.82x3.94	90.3	2500	26.48	540	26.06	22.91	3.84	3496	14.09	11.56	11.09	11.55	10.02
MF240 8 Speed	1519	Die.	4985	770	3	3.60x5.00	152	2000	34.77	540	31.89	29.39	5.30	3824	16.10	13.18	13.72	13.35	11.59
MF250 8 Speed	1520	Die.	5760	1175	3	3.60x5.00	152	2250	40.86	540	36.93	35.07	5.81	4297	15.80	12.38	12.92	12.50	10.72
MF254 12 Speed	1478	Die.	7275	1790	3	3.60x5.00	152	2250	43.36	540	40.71	35.14	5.82	3844	16.58	13.43	12.84	12.51	10.62
MF270 8 Speed	1521	Die.	8195	1295	4	3.875x5.00	236	2000	55.85	540	52.75	47.08	4.96	5896	16.79	12.99	13.44	13.10	11.22
MF274 12 Speed	1479	Die.	8190	2205	4	3.875x5.00	236	2200	55.39	540	54.26	46.76	6.56	4719	17.25	12.80	13.76	12.66	10.59
MF290 12 Speed	1522	Die.	9070	3130	4	3.975x5.00	248	2200	65.92	540	59.37	56.36	6.44	7654	16.58	12.75	13.24	12.76	10.98
MF294 12 Speed	1480	Die.	8645	1925	4	3.975x5.00	248	2100	67.39	540	64.94	56.28	5.77	5665	17.58	14.53	14.68	13.95	12.54
MF298 8 Speed	1523	Die.	11040	3070	4	4.50x5.00	318	2000	79.54	1000	73.66	69.74	5.14	8712	16.31	12.88	13.47	13.14	11.55

Ten-Year Summary of Test Reports, 1979-1988

MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	ENGINE No. of Cylinders	Bore and Stroke	Displacement Cu. in.	Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Drawbar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	FUEL CONSUMPTION (HP Hours Per Gallon) at:- Max. PTO HP at Std. PTO RPM	PTO Average at Varying Power	—Varying Drawbar Power— Max. Available Power	75% of Pull Max. Power	50% of Pull at Max. Power
MF298 12 Speed	1524	Die.	10950	2935	4	4.50x5.00	318	2000	79.26	1000	74.25	67.85	7.73	8663	15.72	11.93	12.40	12.39	10.79
MF670 & 270 12 Speed	1538	Die.	9200	480	4	3.875x5.00	236	2000	55.62	1000	51.44	46.05	4.87	6382	16.39	12.37	12.93	12.10	10.26
MF690 12 Speed	1539	Die.	10795	2275	4	3.975x5.00	248	2200	65.68	540	62.25	54.78	4.77	7650	15.51	11.96	12.01	11.79	9.82
MF698 12 Speed	1540	Die.	12125	2185	4	4.50x5.00	318	2000	78.83	540	74.41	68.38	4.56	8707	15.91	11.91	12.55	12.24	10.59
MF699 12 Speed	1541	Die.	12935	2610	6	3.875x5.00	354	2200	85.79	540	78.00	71.71	4.69	8718	16.96	12.87	13.51	12.66	10.64
MF1020	1552	Die.	2930	700	3	2.953x3.347	68.7	2350	17.08	540	16.24	14.59	5.01	1771	12.53	10.51	10.36	10.44	9.39
MF1030	1553	Die.	3915	925	3	3.228x3.543	87	2500	23.35	540	22.80	18.66	5.70	2277	12.97	10.31	10.04	9.82	8.30
MF1040	1554	Die.	4715	915	3	3.622x3.937	121.7	2500	27.73	540	25.80	22.57	5.52	2795	12.98	10.01	10.07	9.53	7.84
MF2640 16 Speed	1481	Die.	16380	3945	6	3.875x5.00	354	2400	90.95	1000	87.60	74.83	6.58	10623	15.81	11.67	12.15	11.46	9.70
MF2675 8 Speed	1321	Die.	14280	1930	6	3.875x5.00	354	2500	100.84	1000	95.00	86.18	5.91	10226	15.00	11.14	11.48	11.57	10.01
MF2675 24 Speed	1309	Die.	14495	2065	6	3.875x5.00	354	2500	103.29	1000	96.67	87.47	5.09	9674	15.43	11.56	11.76	11.49	9.95
MF2705 8 Speed	1322	Die.	16800	4295	6	3.875x5.00	354	2500	121.11	1000	114.44	101.47	6.17	12588	16.84	11.22	12.54	11.30	9.45
MF2705 24 Speed	1310	Die.	17490	4895	6	3.875x5.00	354	2500	122.20	1000	115.85	104.23	5.30	13085	16.65	11.22	12.74	11.27	9.23
MF2745	1311	Die.	19490	4300	8	4.25x4.75	539	2600	143.40	1000	132.21	125.17	5.51	15386	15.40	10.62	11.96	11.13	9.39
MF2775 8 Speed	1389	Die.	20170	4365	8	4.63x4.75	640	2600	162.09	1000	146.87	139.68	5.73	16766	15.78	11.19	12.45	11.68	9.56
MF2805 8 Speed	1399	Die.	21430	5395	8	4.63x4.75	640	2500	190.81	1000	186.29	164.58	5.41	17647	16.59	10.97	12.41	11.43	9.58
MF3505 16 Speed	1511	Die.	13195	260	6	3.875x5.00	354	2400	91.50	1000	87.47	74.79	6.54	8344	15.53	11.40	11.55	10.90	9.19
MF3525 16 Speed	1512	Die.	14645	1545	6	3.875x5.00	354	2400	108.01	1000	103.67	91.22	6.45	9322	16.67	11.65	12.65	11.53	9.31
MF3545 16 Speed	1513	Die.	17235	3935	6	3.875x5.00	354	2400	126.72	1000	122.15	105.16	6.82	10563	17.01	12.11	12.96	11.47	9.64
MF4800 12 & 18 Speed	1342	Die.	30520	0	8	5.5x4.75	903	2600	179.31	1000	172.88	159.08	4.82	25294	15.10	10.12	12.13	10.73	8.39
MF4840 12 & 18 Speed	1343	Die.	30920	0	8	5.5x4.75	903	2600	210.67	1000	210.61	186.36	4.84	28191	15.57	10.77	12.41	11.25	9.32
MF4880 12 & 18 Speed	1344	Die.	32450	1360	8	5.5x4.75	903	2600	272.81	1000	267.38	244.57	6.54	29272	16.80	11.51	13.50	11.98	9.58
MF4900 18 Speed	1391	Die.	33940	2975	8	5.5x4.75	903	2600	320.55	1000	323.88	278.78	6.53	30090	16.80	11.95	13.26	11.82	9.87
Satoh S750DD & S750D 9 Speed	1347	Die.	5550	1620	3	3.386x4.016	108.4	2500	33.45	540	28.11	28.99	5.93	4295	11.92	10.89	9.86	11.18	9.58
Steiger Bearcat 1000	1592	Die.	28575	0	6	4.75x6.00	638	2100	218.00	1001	218.00	195.49	4.45	28566	16.61	13.41	14.68	13.57	11.60
Cougar 1000	1593	Die.	31270	2820	6	4.75x6.00	638	2100	259.96	1001	259.96	230.18	6.59	30981	---	---	15.17	14.31	12.53
Bearcat III ST-225(1)	1414	Die.	30005	465	6	4.75x6.00	638	2100	---	---	---	197.69	5.47	28805	---	---	13.99	13.54	11.65
Bearcat IV KM-225	1542	Die.	33830	5430	6	4.921x5.354	611	2100	---	---	---	193.11	4.18	31556	---	---	16.43	15.28	13.12
Cougar CR-1225	1577	Die.	29190	0	6	4.75x6.00	638	2100	208.61	999	208.61	184.83	5.16	29570	16.46	13.29	14.40	13.46	11.44
Cougar CR-1280	1578	Die.	29600	0	6	4.75x6.00	638	2100	258.15	999	258.15	231.19	5.19	28708	17.19	14.18	15.18	14.30	12.36
Cougar III ST-250(2)	1452	Die.	29965	0	6	4.75x6.00	638	2100	---	---	---	215.98	6.11	29539	---	---	15.16	14.40	12.76
Cougar III PTA-280	1402	Die.	33675	2895	6	5.50x6.00	855	2100	---	---	---	224.92	5.54	32625	---	---	13.74	12.54	10.44
Cougar III PTA-280	1413	Die.	33150	2370	6	5.40x6.50	893	2100	---	---	---	236.55	7.07	32085	---	---	14.24	13.14	11.19
Cougar III ST-280	1401	Die.	33105	2625	6	5.50x6.00	855	2100	---	---	---	236.82	5.37	31517	---	---	14.55	13.20	11.05
Cougar III ST-280	1412	Die.	33345	2705	6	5.40x6.50	893	2100	---	---	---	246.13	6.28	32099	---	---	14.85	13.76	11.69
Panther III PTA-325	1355	Die.	33960	3140	6	5.40x6.50	893	2100	---	---	---	274.88	5.34	31876	---	---	14.26	13.45	11.55
Panther IV KM-325	1543	Die.	33715	3955	6	5.50x6.00	855	2100	---	---	---	285.67	6.78	32565	---	---	16.04	14.79	13.00
Panther IV CM-360	1544	Die.	33740	3815	6	5.40x6.50	893	2100	---	---	---	324.84	6.73	32328	---	---	15.96	15.15	13.29
Panther IV SM-325	1550	Die.	33930	5030	6	4.921x5.906	674	2100	---	---	---	278.09	6.78	33651	---	---	17.12	15.98	14.22
Panther CP-1325 12-Speed	1453	Die.	35870	410	6	5.40x6.50	893	2100	299.10	1002	299.10	266.97	6.95	33802	16.55	13.59	14.71	13.86	11.95
Panther CP-1360 12-Speed	1455	Die.	39120	3860	6	5.40x6.50	893	2100	334.33	1002	334.33	294.07	6.89	36123	16.75	13.78	14.60	13.81	11.85

Panther CP 1400																			
12 Speed	1464	Die	43615	7165	6	5.40x6.50	893	2100	—	—	—	334.94	8.17	40272	—	—	14.92	14.12	12.07
Panther KP 1325																			
12 Speed	1465	Die	35815	605	6	5.50x6.00	855	2100	301.21	1002	301.21	267.87	6.93	34267	17.36	13.97	15.58	14.15	11.84
Panther KP 1360																			
12 Speed	1456	Die	39570	4090	6	5.50x6.00	855	2100	326.12	1002	326.12	291.14	6.92	36771	17.39	14.15	15.45	14.27	12.15
Panther KP 1400																			
12 Speed	1463	Die	43175	6640	6	5.50x6.00	855	2100	—	—	—	333.18	4.82	40803	—	—	15.87	14.54	12.10

(1) SN. 109-00328 and higher (2) SN. 104-00331 and higher (3) Equipped with hydrostatic PTO 105HP at 1000 RPM.

Valmet																			
980 4x4	1599	Die	13265	5000	4	4.01x4.72	239	2300	88.01	540	80.55	78.04	6.71	10722	18.23	13.14	14.35	13.19	11.26
148 4x4	1600	Die	16830	5920	6	4.01x4.72	359	2300	126.89	1000	127.11	110.09	4.94	13574	16.92	13.63	14.29	13.29	11.71
Versatile																			
256 Hydrostatic	1518	Die	10460	1310	4	4.02x4.72	239	2500	84.36	540	85.08	62.81	5.49	9134	16.45	12.67	11.82	11.07	9.52
276 Hydrostatic	1565	Die	10510	1310	4	4.02x4.72	239	2500	100.22	540	102.14	70.91	5.61	7892	16.50	12.86	11.37	10.25	8.63
555	1331	Die	25980	6330	8	4.625x4.125	555	2850	182.25	1000	184.35	154.20	4.56	23533	16.33	11.15	12.96	11.17	8.83
835 12	1356	Die	26000	3720	6	5.50x6.00	855	2100	198.23	1009	198.23	179.07	6.13	26380	15.13	11.36	13.16	11.87	9.70
835 Series 3 12 Speed SN. 835-83-036769 & higher	1482	Die	27980	3595	6	5.50x6.00	855	2100	200.30	1009	200.30	181.14	5.34	25687	15.84	11.86	14.45	12.74	10.45
836 Manual	1566	Die	25960	1300	6	4.921x5.354	611	2100	192.54	1008	192.54	170.56	4.83	24123	17.71	13.80	15.59	14.11	11.99
836 Powershift	1567	Die	25995	1535	6	4.921x5.354	611	2100	181.04	997	181.04	161.45	6.77	24723	16.65	12.56	14.80	13.34	11.24
856 Powershift	1568	Die	28000	2920	6	4.921x5.354	611	2100	209.28	997	209.28	185.04	5.88	26479	17.24	13.22	15.35	13.59	11.40
875	1332	Die	29480	4160	6	5.50x6.00	855	2100	247.16	1008	247.16	221.66	4.86	26795	16.06	12.02	14.35	12.53	10.34
875 Series 3 12 Speed SN. 875-83-057906 & higher	1483	Die	29500	3870	6	5.50x6.00	855	2100	252.67	1008	252.67	227.48	5.65	26725	16.82	13.06	15.25	13.73	11.82
876 Manual	1569	Die	29500	4540	6	4.921x5.354	611	2100	—	—	—	233.92	6.53	27703	—	—	16.85	15.68	13.65
895 12 Speed	1335	Die	32500	7880	6	5.50x6.00	855	2100	—	—	—	261.63	6.45	29402	—	—	15.15	13.72	11.57
936 Manual	1570	Die	32385	5260	6	5.50x6.00	855	2100	—	—	—	260.45	6.78	29495	—	—	15.47	14.04	12.09
1150 8 Speed	1462	Die	46500	11360	6	6.25x6.25	1150	2100	—	—	—	400.29	5.92	43219	—	—	15.84	14.64	12.35
White																			
2-30 8 Speed	1373	Die	3853	848	3	3.386x3.386	91.4	2600	28.33	540	24.50	25.81	8.35	2816	12.03	10.27	10.77	11.42	9.61
2-35 8 Speed	1374	Die	3970	800	3	3.386x4.02	108.4	2400	32.84	540	30.94	30.37	8.00	2978	12.68	10.86	11.23	11.73	10.35
2-45 20 Speed	1395	Die	6630	660	4	3.858x3.62	169.3	2250	43.73	540	36.62	37.32	3.97	4455	12.70	11.15	10.96	11.00	9.66
2-55 16 Speed	1466	Die	7055	860	4	4.02x3.94	199.4	2200	53.32	540	45.74	48.49	4.88	5037	14.89	12.38	13.35	13.21	11.39
2-62 20 Speed	1396	Die	6875	635	4	4.016x4.33	219	2200	61.46	540	54.25	51.63	6.05	4695	16.31	13.85	13.76	13.49	12.08
2-65 16 Speed	1467	Die	7110	790	4	4.02x4.65	235	2200	62.50	540	55.40	56.67	6.51	4827	16.19	12.91	13.94	13.20	11.29
2-75 16 Speed	1486	Die	9625	1705	6	4.016x4.33	329	2200	75.39	1000	75.64	65.05	6.04	6487	15.86	12.07	13.01	12.21	10.48
2-88 18 Speed	1487	Die	13615	0	6	3.875x5.00	354	2200	86.78	1007	86.78	74.67	6.51	9486	15.71	12.69	13.62	12.74	10.79
100	1614	Die	14485	545	6	4.02x4.72	359	2400	94.35	1000	93.48	82.57	5.97	13629	14.97	11.86	12.77	11.88	10.15
2-110 18 Speed	1468	Die	13955	0	6	3.875x5.00	354	2200	110.52	1007	110.52	94.90	6.40	9500	16.77	13.27	14.19	13.08	10.84
120	1615	Die	15315	850	6	4.02x4.72	359	2200	119.13	1000	121.94	104.69	6.62	14286	16.94	13.11	14.76	13.57	11.49
140	1616	Die	15665	1000	6	4.02x4.72	359	2200	138.53	1000	140.30	125.01	6.17	15060	17.49	14.29	15.39	14.58	12.62
160	1607	Die	18850	1560	6	4.49x5.32	504.5	2200	162.47	1000	165.97	142.74	6.24	18055	17.78	14.36	15.45	14.34	12.29
4-175 Field Boss	1375	Die	20420	0	8	4.50x5.00	636	2600	151.69	1000	151.29	133.72	6.39	19905	15.50	11.70	12.96	11.98	10.01
185	1608	Die	18770	1620	6	4.49x5.32	504.5	2200	187.55	1000	192.38	167.72	6.18	18318	17.35	14.19	15.21	14.34	12.40
4-210 Field Boss	1318	Die	23735	0	8	4.50x5.00	636	2800	182.44	1000	182.44	162.25	5.89	22934	14.26	11.53	12.34	12.10	10.25
4-225	1558	Die	24140	0	8	4.50x5.00	636	2600	195.65	1002	195.65	170.57	5.47	22865	15.60	12.06	13.64	12.42	10.44
4-270	1559	Die	30650	0	6	4.75x6.00	638	2100	239.25	1000	242.30	211.70	6.60	27180	16.69	13.60	14.53	13.53	11.90
Yanmar																			
YM226D	1442	Die	3380	1080	3	2.95x3.35	68.7	2600	19.42	540	17.87	16.14	4.78	2073	15.07	11.67	11.92	10.93	9.26
YM276D	1443	Die	4110	1405	3	3.31x3.35	86.2	2600	23.00	540	22.82	18.93	5.78	2412	14.35	11.06	11.08	10.57	8.90
YM336D	1444	Die	5020	1615	3	3.31x3.54	91.3	2600	26.98	540	25.63	23.00	6.28	3086	14.27	11.32	11.39	10.66	9.64
Zetor																			
5245/5211	1571	Die	7295	385	3	4.02x4.33	164.6	2200	42.51	540	40.10	38.84	5.79	5955	16.56	13.17	14.59	13.83	12.10
6245 (6211)	1601	Die	8535	885	4	3.94x4.33	211	2200	53.09	540	50.23	47.43	5.57	6332	16.82	13.51	14.36	13.90	12.33
7245/7211	1572	Die	8565	725	4	4.02x4.33	219	220	58.28	540	54.91	52.52	5.95	6356	16.06	13.04	13.84	13.34	11.50
7745 (7211)	1602	Die	10360	2455	4	4.02x4.72	239	2200	65.74	540	62.17	57.56	6.63	7484	17.01	13.94	14.30	13.72	12.05

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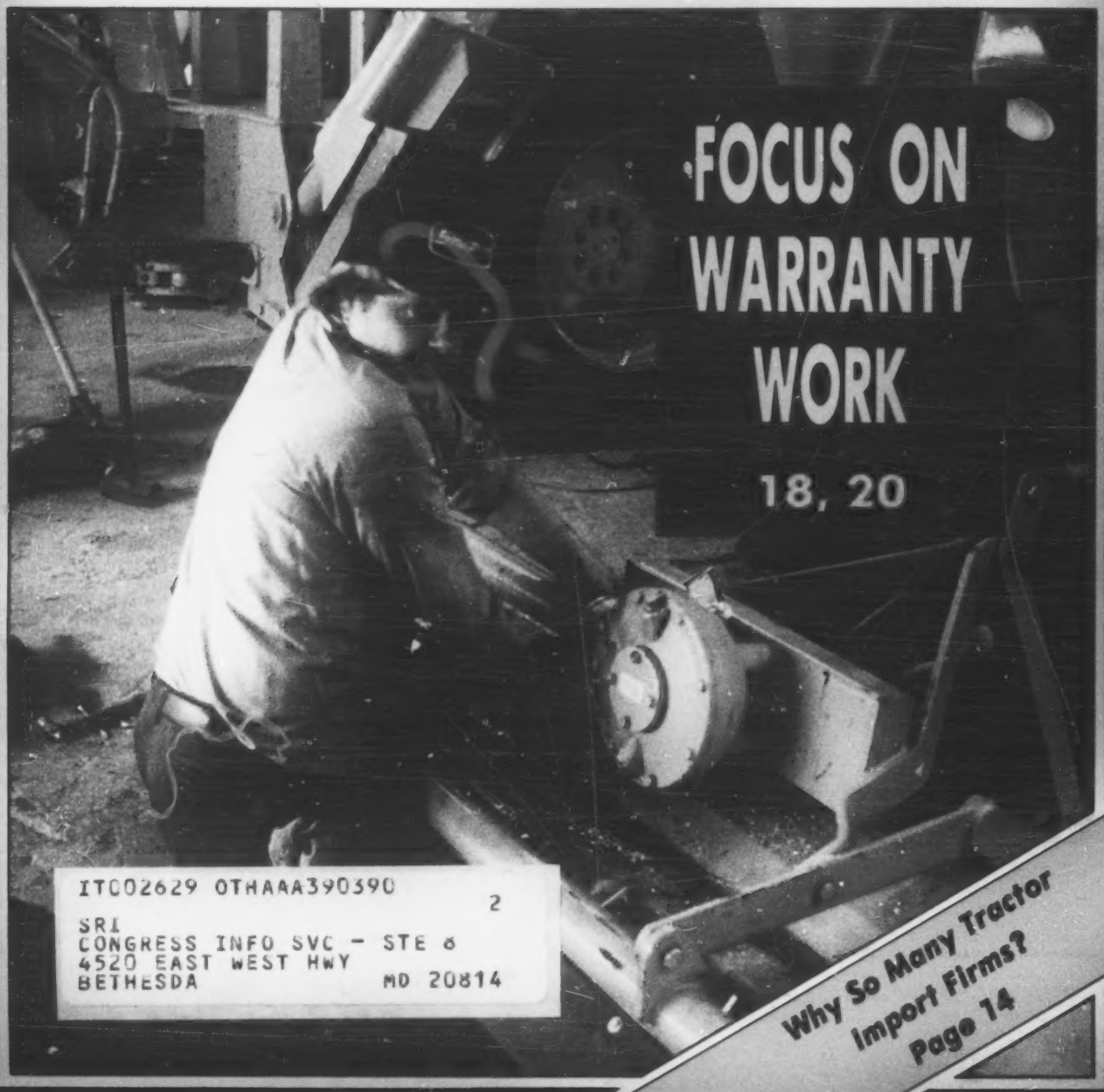
I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

The business magazine of the farm and industrial equipment industry

April 1989

Where Horsepower Sold in 1988 page 12



FOCUS ON WARRANTY WORK

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Why So Many Tractor Import Firms? Page 14

I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

The business magazine of the farm and industrial equipment industry.

April 1989 • Vol. 104 • No. 5

On Our Cover

Two articles explore the issue of extended warranty and its impact on dealers.

(Photo taken by Glenn S. Hensley at Sharp Ford Tractor Co., St. Louis, Mo.)

18, 20

12: **Tractor Sales:** State-by-state breakdown of farm wheel tractor sales by horsepower categories.

14: **Imports, Part III:** The softened dollar was supposed to make it tougher for imported farm tractors. For some, it has. For others, it has opened a window of opportunity.

18: **Warranty Costs:** An I&T survey indicates many dealers are fuzzy on the subject. Bottom line: Warranty costs to dealers will become a stickier issue.

19: **Dealers Comment:** Dealers voice their ideas about warranty costs.

20: **Warranty Losses:** What can be done? Is it anybody's fault? Is it everybody's? A pro offers suggestions for both parties.

22: **Fuel Efficiency:** An update of I&T's 1982 study. Which of the 180 models tested at Nebraska 1982-86 fared best—and worst?

24: **Dealers of** the '90s: Shortline marketer sees a multi-franchise world. Do you like the idea? Do you agree?

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Retail Sales: Big Tractors Up, Small Units Down

Sales of big tractors (two-wheelers over 100 hp and all four-wheelers) were up strongly in February and for the year to date. But tractors under 40 hp, mostly from Japan, were off substantially.

UNIT RETAIL SALES

Equipment	February 1989	February 1988	% Change	January-February 1989	January-February 1988	% Change
Farm Wheel Tractors:						
2-Wheel Drive						
Under 40 HP	2,210	2,614	(15.5)	4,440	5,749	(22.8)
40 & Under 100 HP	2,151	2,182	(1.4)	4,238	4,559	(5.1)
100 & Under 140 HP	323	240	34.6	738	750	(1.6)
140 HP & Over	1,022	585	74.7	23,310	1,832	26.1
Total 2-Wheel Drive	5,706	5,621	1.5	11,816	12,890	(8.3)
4-Wheel Drive						
Under 200 HP	92	46	100.0	191	112	70.5
200 HP & Over	197	99	99.0	362	213	70.0
Total 4-Wheel Drive	289	145	99.3	553	325	70.2
Total Farm Wheel Tractors	5,995	5,766	4.0	12,369	13,215	(6.4)
Combines (Self-Propelled)	196	220	(10.9)	561	822	(31.8)
Balers (Bales under 200 lbs)	260	169	53.8	558	357	56.3
Forage Harvesters (Shear Bar Type)	81	87	(6.9)	166	150	10.7
Mower Conditioners	476	365	30.4	904	654	38.2

1988 Exports, Imports: Strong Volume Increases

Exports and imports of farm equipment in 1988 were up strongly over 1987 activity, according to the U.S. Dept. of Commerce. Export volume rose by 21.2 percent to $1.911 billion; imports went up 20.5 percent to 2.207 million. It was an all-time high for imports; exports peaked in 1984 at $2.23 billion, then fell to $1.47 billion in 1986.

U.S. farm equipment was exported to over 170 nations in 1988. Principal customers were Canada ($585 million, down 9 percent), Saudi Arabia ($128 million, up 12 percent), France ($129 million, up 34 percent), Australia ($122 million, up 148 percent), Mexico ($122 million, up 79 percent), Britain ($98 million, up 57 percent), Belgium ($82 million), West Germany ($76 million, up 38 percent) and Venezuela ($63 million, up 9 percent).

Major sources of farm equipment imports to the U.S. were: Canada ($576 million, up 15 percent), Japan ($389 million, down 7 percent), Britain ($366 million, up 44 percent), West Germany ($290 million, up 18 percent), Italy ($155 million, up 20 percent), and France ($119 million, up 85 percent). Farm equipment was imported from 70 nations in 1988.

Deere's 1st Quarter: Sales Hit $1.14 Billion

Deere & Co. has reported worldwide net sales to dealers of $1.141 billion in the first quarter of 1989, ended Jan. 31, an increase of 9 percent from 1988.

Earnings were $48.4 million compared with $67.5 million in the same 1988 quarter. The results reflect "significant improvement in pretax income from operations, although net income is lower because of nonrecurring gains in last year's initial quarter," in which there was a one-time gain of $28.7 million as a result of an accounting rule change, plus $9.3 million from tax-loss carryforwards.

Deere says it has raised production schedules for all products by 14 percent over actual 1988 output.

Changes...

Davis H. Morris is new president of Toro Co. He joined the company in 1979 and has been chief operating officer since July, 1988.

Husqvarna Power Products, Itasca, Ill., has changed its name to Husqvarna Forest & Garden Co. It is the North American marketing company of Sweden's Husqvarna Forest & Garden A.B.

Agfor Inc., farm equipment distributor based at Plessisville, Que., has named Luc A. Cazabon as its executive vice-president and general manager.

Snapper Power Equipment, McDonough, Ga., has given its president, Richard E. Robinson, the added duties of chief executive officer. Clifford H. Boylston, executive vice-president, takes on the added responsibilities of engineering and manufacturing operations. John Steed is new marketing services manager and David Bernhardt is advertising manager.

Robert L. Vermeer and Mary V. Andringa have been named chairman of the board/CEO and president/COO, respectively, of Vermeer Mfg. Co., Pella, Ia. Earlier, they had shared the office of president with their father, Gary Vermeer, who founded the $100 million-plus company.

Big Ox, manufacturers of rear blades, box blades, V plows and other products, is now part of Heartland Products Group, Galva, Ill. Production of the line is now based at Galva. New products currently being introduced include rotary cutters, estate mowers, tillers, pulverizers and rollover box blades.

ZF of North America, Lincolnshire, Ill., has leased a 57,700-sq.-ft. building at Vernon Hills, Ill., to house service facilities and related office space for its Automotive and Off-Highway Divs.

1988 FARM WHEEL TRACTOR UNIT SALES

SALES FIGURES IN UNITS BY HORSEPOWER CATEGORIES

State	Two-Wheel Drive Tractors																	Four-Wheel Drive Tractors				Total All Farm Wheel Tractors	State
	Under 20	20 & Under 30	30 & Under 40	40 & Under 50	50 & Under 60	60 & Under 70	70 & Under 80	80 & Under 90	90 & Under 100	100 & Under 110	110 & Under 120	120 & Under 130	130 & Under 140	140 & Under 160	160 & Under 180	180 & Over	Total 2WD	Under 200	200 & Under 250	250 & Over	Total All 4 WD		
Alabama	635	734	374	358	298	146	155	113	9	21	8	17	4	53	25	9	2,959	--	2	--	2	2,961	Alabama
Alaska	6	3	1	1	--	--	--	--	--	--	--	1	--	--	--	--	12	--	--	--	--	12	Alaska
Arizona	103	79	36	40	18	35	52	91	15	22	17	18	32	52	20	47	677	1	2	5	8	685	Arizona
Arkansas	575	543	254	334	297	245	181	55	10	5	--	3	8	76	112	447	3,145	19	24	62	105	3,250	Arkansas
California	1342	1265	413	210	388	420	732	517	155	58	24	63	72	122	83	99	5,963	15	37	35	87	6,050	California
Colorado	178	142	49	38	42	42	30	17	8	8	10	15	11	60	52	48	750	44	24	30	98	848	Colorado
Connecticut	443	313	123	58	58	36	8	6	9	--	--	2	--	8	--	1	1,065	--	--	--	--	1,065	Connecticut
Delaware	102	111	26	21	33	17	25	2	3	--	3	4	1	9	7	5	369	--	7	5	12	381	Delaware
Florida	1,016	873	590	471	255	307	432	400	75	33	8	49	8	47	18	33	4,615	27	35	6	68	4,683	Florida
Georgia	937	788	583	712	393	208	276	228	42	32	9	63	32	192	73	76	4,644	2	2	1	5	4,649	Georgia
Hawaii	41	58	42	12	10	15	11	4	--	--	--	1	--	--	--	--	194	--	1	1	2	196	Hawaii
Idaho	58	48	22	14	25	34	31	18	8	8	8	11	17	58	33	97	490	7	3	13	23	513	Idaho
Illinois	792	345	114	140	237	173	173	83	33	19	25	60	105	387	183	201	3,070	68	46	59	173	3,243	Illinois
Indiana	713	453	148	101	80	137	93	69	19	22	26	29	47	188	107	118	2,348	35	21	44	100	2,448	Indiana
Iowa	221	103	30	50	60	143	162	118	67	59	51	124	161	683	278	206	2,516	59	20	32	111	2,627	Iowa
Kansas	271	143	53	50	40	105	79	52	37	42	36	74	50	306	215	225	1,778	104	108	56	268	2,046	Kansas
Kentucky	544	329	238	399	361	243	159	108	16	6	8	13	6	22	20	34	2,508	--	2	12	14	2,520	Kentucky
Louisiana	586	577	170	148	64	178	106	46	8	5	7	29	7	35	100	148	2,212	25	24	17	66	2,278	Louisiana
Maine	422	236	94	40	40	29	13	5	3	1	4	--	8	3	5	--	903	--	--	--	--	903	Maine
Maryland	832	559	199	118	97	59	49	28	7	5	11	16	10	21	7	4	2,022	1	2	--	3	2,025	Maryland
Massachusetts	424	345	104	43	48	41	20	11	4	--	1	1	--	1	--	--	1,043	2	--	--	2	1,045	Massachusetts
Michigan	982	621	216	133	200	179	117	78	27	13	22	19	20	78	44	33	2,782	32	13	11	56	2,838	Michigan
Minnesota	248	129	50	44	65	108	115	88	39	51	49	97	60	386	135	113	1,777	80	47	100	227	2,004	Minnesota
Mississippi	318	412	243	275	147	179	113	92	11	5	3	14	7	72	157	305	2,351	3	9	9	21	2,372	Mississippi
Missouri	800	443	182	270	242	290	204	161	25	64	36	51	37	227	67	169	3,268	24	24	49	97	3,365	Missouri
Montana	55	51	11	4	12	13	34	38	18	19	5	19	10	35	16	7	347	38	27	14	79	426	Montana
Nebraska	106	52	13	20	25	33	66	67	32	49	32	99	95	432	229	235	1,585	57	25	8	90	1,675	Nebraska
Nevada	32	29	5	1	5	7	5	1	2	2	--	1	--	1	--	2	87	--	1	--	1	88	Nevada
New Hampshire	431	421	129	50	32	22	13	5	2	2	1	1	1	6	1	--	1,117	1	--	--	1	1,118	New Hampshire
New Jersey	474	410	145	89	128	40	54	14	10	7	3	5	2	5	4	4	1,395	1	--	--	1	1,396	New Jersey
New Mexico	69	98	84	24	12	26	22	17	14	6	1	9	5	30	15	24	456	--	5	1	6	462	New Mexico
New York	1,373	1,008	350	260	222	187	147	157	40	17	20	35	27	66	17	13	3,937	9	3	4	16	3,953	New York
North Carolina	1,262	859	843	775	331	244	231	252	60	44	21	50	32	106	32	76	5,218	2	2	--	4	5,222	North Carolina
North Dakota	80	32	11	10	19	11	17	25	16	14	16	36	31	189	72	44	623	80	77	128	285	908	North Dakota
Ohio	1,498	684	229	230	224	203	170	108	26	26	25	40	43	141	56	55	3,758	22	6	5	33	3,791	Ohio
Oklahoma	482	324	116	104	97	91	99	85	15	22	16	31	23	133	52	38	1,729	36	64	64	164	1,893	Oklahoma
Oregon	645	303	102	82	119	73	75	71	13	11	4	18	8	52	23	13	1,612	13	7	8	28	1,640	Oregon
Pennsylvania	2,057	970	337	222	201	221	139	106	52	21	30	24	28	34	7	13	4,462	9	2	--	11	4,473	Pennsylvania
Rhode Island	50	32	12	6	1	13	--	--	1	--	--	--	--	--	--	--	115	--	--	--	--	115	Rhode Island
South Carolina	635	508	410	429	130	261	87	78	11	5	1	11	4	28	13	35	2,646	2	1	2	5	2,651	South Carolina
South Dakota	30	17	10	8	30	24	36	21	51	46	54	82	75	205	88	60	837	85	41	53	179	1,016	South Dakota
Tennessee	1,029	751	391	516	430	258	181	99	14	11	11	19	12	83	97	113	4,015	3	4	8	15	4,030	Tennessee
Texas	1,362	1,218	514	644	361	601	393	273	61	40	40	67	88	498	288	391	6,839	36	43	71	150	6,989	Texas
Utah	56	54	16	24	17	32	23	14	6	1	5	5	7	13	7	3	283	4	1	--	5	288	Utah
Vermont	241	134	53	27	39	38	24	21	10	3	4	6	3	7	1	1	612	--	--	--	--	612	Vermont
Virginia	1,065	747	536	404	353	235	162	110	19	15	4	18	12	23	6	13	3,722	1	--	1	2	3,724	Virginia
Washington	336	236	76	133	196	89	92	43	15	2	3	8	10	45	19	22	1,325	15	21	17	53	1,378	Washington
West Virginia	206	100	100	106	79	48	27	8	3	2	3	1	1	1	--	--	685	--	--	--	--	685	West Virginia
Wisconsin	305	199	62	70	150	182	202	175	80	40	49	81	52	118	44	35	1,844	26	7	7	40	1,884	Wisconsin
Wyoming	15	7	4	2	11	11	5	9	8	2	--	4	4	16	6	1	105	10	1	1	12	117	Wyoming
U.S. Government	--	--	32	4	3	312	--	--	7	--	--	--	--	--	--	--	368	--	--	1	1	369	U.S. Government
Miscellaneous	34	249	142	71	--	18	307	14	--	--	--	--	--	--	--	--	835	--	--	--	--	635	Miscellaneous
TOTAL	26,516	19,137	9,088	8,405	6,725	6,660	5,947	4,201	1,218	888	714	1,444	1,276	5,353	2,834	3,615	104,017	998	791	940	2,729	106,746	TOTAL

NOTE: One under-20-hp tractor was sold in the District of Columbia in 1988.
DATA SOURCE: Farm & Industrial Equipment Institute. Figures do not include garden tractors, motor tillers or contractor's off-highway types. Report includes units marketed by these firms. Case International, Deere, Deutz-Allis, Ford New Holland, Hesston, Kubota, Long, Massey-Ferguson, SAME, Steiger, Versatile, White-New Idea and Yanmar. Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Why Doesn't Fuel Efficiency Get Better?

It's time for an update of I&T's 1982 study. Which of the 180 models tested at Nebraska from 1982 through 1986 fared best—and worst?

By FRANK BUCKINGHAM

APOLOGISTS for poor tractor fuel efficiency have some explaining to do. Their story is that the declining quality of diesel fuel is seriously reducing efficiency. But if that's so, why did 18 of the 21 most fuel-efficient tractors tested at Nebraska from 1982 through 1986 reach that level on fuel weighing less than the average of all fuel used in the 180 tests?

Why did the 20 least efficient tractors tested in those years have the supposed advantage of fuel somewhat*heavier* than the average used by all tractors?

Fuel isn't as good as it was. Does this mean there are some unknown power-producing factors in that lighter fuel? Or have the companies selling those more efficient models learned to better use lighter fuel?

Nebraska tractor sales permits may now be based on tests of the Organization for Economic Cooperation and Development or ASAE/SAE. Manufacturers may use either test from now on.

In *I&T*, March 21, 1982, our article reporting on the industry's fuel efficiency track record said: "A number of studies show that fuel consumption at 75 percent of maximum drawbar load in the Nebraska tests is a reasonable approximation of tractor fuel consumption under load in normal field work.... We've used hp-hrs/gal to put all tractors on an equal basis to show how much work each one can do on a gallon of fuel."

But some say that due to varying density, lbs/hp-hr is a more accurate indicator of fuel efficiency. So those figures were used in a second article in the July 15, 1982, *I&T*, though they showed little change in relative efficiency. The latest study focuses primarily on lbs/hp-hr in the test at 75 percent of maximum drawbar load.

Fuel weight in the 1982-86 tests varied less than 2 percent, averaging 6.984 lbs/gal.

Comparing then and now

Of the 180 models tested in the 1982-86 period, 31 were four-wheelers. Of these, 15 were among the 21 tractors with the highest fuel efficiency—14.04 to 15.98 hp-hrs/gal (0.436 to 0.497 lbs/hp-hr) at 75 percent maximum drawbar load. But nine of those fuel-efficient four-wheelers had no pto and were drawbar-tested only, thus eliminating small power losses in the pto drive.

The 180-tractor average lbs/hp-hr was down 4.3 percent from the 1979-81 test average and off 2.7 percent from the 1959-81 average. The 1982-86 two-wheel-drive average fell 0.2 percent from 1959-70—0.560 lbs/hp-hr vs. 0.559. Efficiency of the 1982-86 4WDs was about 9 percent better than in 1979-81 and about 8 percent up from 1959-70 tests.

Are we to assume that convenience features, better hydraulics, etc., consume power and fuel and that today's tractors outperform those earlier models in the field? It's probably true. But no tractor has been tested at Nebraska with the air conditioner or cab fan going. And most current tractor literature proclaims that new hydraulic systems are more efficient than earlier versions. So let's be careful about blaming hydraulics for cutting fuel efficiency.

Are the real thieves the transmission and the power train? It seems likely. Most 1982-86 manual transmission tractors had better fuel efficiency than similar powershift or shift-on-the-go models. However, two Fords with synchromesh transmissions had slightly better efficiency than the same models with manual transmissions and an equal number of gears.

AVERAGE TRACTOR

LBS/HP-HR. (Nebraska Tests,

Company (No. of models Tested)	1982-86 2WD	1982-86 4WD	1982-86 All
Allis-Chalmers (41)	0.591	—	0.591
Deutz (18)	0.523	—	0.523
All Deutz-Allis (59)	0.568	—	0.568
Belarus (5)	—	—	—
Big Bud (1)	—	—	—
Case (85)	0.535	0.503	0.532
IH (76)	0.596	—	0.596
Case IH (4)	0.552	—	0.552
All Case IH (165)	0.556	0.503	0.553
John Deere (89)	0.543	0.521	0.541
Ford (88)	0.576	—	0.576
Hesston-Fiat (31)*	0.532	—	0.532
Kubota (33)	0.547	—	0.547
Long (8)	—	—	—
Massey-Ferguson (77)	0.588	—	0.588
Same (3)	—	—	—
Steiger (36)	—	0.486	0.486
Valmet (2)	0.530	—	0.530
Versatile (15)	—	0.532	0.532
White (62)**	0.544	0.538	0.543
Yamar (4)	0.650	—	0.650
Zetor (7)	0.516	—	0.516
Average All Tractors (685)	0.560	0.508	0.551

Numbers in parentheses indicate number of tractor

Hydrostatics

Fuel efficiency of hydrostatic tractors is notoriously low, especially during constant-load operation such as Nebraska testing. But they can generally outwork mechanical transmissions under varying load conditions. However, three hydrostatic tractors tested in 1982-86 were *not* the least fuel efficient. The manual transmission MF 1040 at 9.53 hp-hrs/gal and 0.732 lbs/hp-hr was bettered by the IH 3488 Hydro with 9.73 hp-hrs/gal and 0.717 lbs/hp-hr in the 75 percent drawbar load test. Versatile's hydrostatic bi-directional 276 and 256 tractors ranked fifth and 18th from the bottom respectively.

Eight IH Hydros used 25 percent more fuel per hp-hr than non-hydro IH 2WDs in 1959-86 tests, and two 4WD Versatile hydros burned 24 percent more fuel than non-hydro Versatiles. Pulling out hydrostatic tests boosts average IH 2WD efficiency and Versatile efficiency both about 3 percent over the 28 years.

Ups and downs

Deutz-Allis overall 1959-86 average fuel use includes Allis-Chalmers tests which ran 2.7 percent more than the average for all tractors tested, and Deutz, which were 10.5 percent below the all-tractor average. However, the 1982-86 average A-C and Deutz fuel use is almost 3 percent more than the 1959-81 average for the same lines. Three 1982-86 Deutz tests now apply to Deutz-Allis models.

The **Case IH** summary includes four Case IH tests plus earlier Case tests (3.4 percent less fuel than the average for all 1959-86 tests) and IH tests (fuel use 6 percent more than average). The 1982-86 combined Case and IH average was about 2 percent better than their combined 1959-81 average. About one in eight IH tested in the 28 years was hydrostatic.

Three **Deere** models were in the 21 most efficient 1982-86 models. Deere 2WD fuel efficiency was over 10 percent better than in 1979-81; 7.7 percent better than in 1959-81. In the same periods, Deere 4WDs

(See FUEL EFFICIENCY, pg. 30)

MAKERS' FUEL EFFICIENCY

1959-1986, at 75 percent of maximum drawbar load)

1979-81 2WD	1979-81 4WD	1979-81 All	1971-78 2WD	1971-78 4WD	1971-78 All	1959-70 2WD	1959-70 4WD	1959-70 All	1959-81 2WD	1959-81 4WD	1959-81 All	1959-86 2WD	1959-86 4WD	1959-86 All	1982-86 Fuel Wt. Lbs/Gal
0.593	—	0.593	0.572	0.612	0.576	0.564	—	0.564	0.572	0.612	0.575	0.575	0.612	0.577	6.975
0.509	—	0.509	0.494	—	0.494	—	—	—	0.499	—	0.499	0.503	—	0.503	7.012
0.551	—	0.551	0.542	0.612	0.547	0.564	—	0.564	0.549	0.612	0.552	0.552	0.612	0.554	6.987
—	0.500	0.500	0.521	—	0.521	—	—	—	0.521	0.500	0.513	0.521	0.500	0.513	—
—	0.502	0.502	—	—	—	—	—	—	—	0.502	0.502	—	0.502	0.502	—
0.563	0.547	0.560	0.548	0.564	0.551	0.533	0.535	0.533	0.543	0.552	0.544	0.542	0.547	0.543	6.990
0.588	0.576	0.585	0.603	0.583	0.600	0.595	0.568	0.592	0.597	0.577	0.594	0.597	0.577	0.594	6.974
—	—	—	—	—	—	—	—	—	—	—	—	0.552	—	0.552	7.004
0.577	0.564	0.574	0.577	0.574	0.577	0.557	0.551	0.557	0.569	0.565	0.569	0.567	0.562	0.567	6.988
0.605	0.536	0.594	0.597	0.553	0.590	0.575	—	0.575	0.589	0.547	0.585	0.576	0.539	0.572	6.992
0.595	—	0.595	0.573	0.555	0.570	0.548	—	0.548	0.562	0.555	0.561	0.567	0.555	0.566	6.956
0.520	—	0.520	0.510	—	0.510	0.632	—	0.632	0.534	—	0.534	0.533	—	0.533	6.985
0.599	—	0.599	0.640	—	0.640	—	—	—	0.620	—	0.620	0.583	—	0.583	7.002
0.528	—	0.528	0.528	—	0.528	—	—	—	0.528	—	0.528	0.528	—	0.528	—
0.625	0.617	0.624	0.545	0.644	0.547	0.525	—	0.525	0.562	0.587	0.565	0.569	0.587	0.571	6.993
—	—	—	0.560	—	0.560	—	—	—	0.560	—	0.560	0.560	—	0.560	—
—	0.552	0.552	—	0.550	0.550	—	—	—	—	0.542	0.542	—	0.519	0.519	6.984
—	—	—	—	—	—	—	—	—	—	—	—	0.530	—	0.530	7.016
—	0.577	0.577	—	0.566	0.566	—	—	—	—	0.575	0.575	—	0.546	0.546	6.986
0.591	0.580	0.588	0.565	0.586	0.570	0.579	—	0.579	0.576	0.584	0.577	0.573	0.573	0.573	6.999
—	—	—	0.578	—	0.578	—	—	—	0.578	—	0.578	0.632	—	0.632	6.973
—	—	—	—	—	—	0.523	—	0.523	0.523	—	0.523	0.521	—	0.521	6.974
0.583	0.557	0.576	0.569	0.563	0.568	0.559	0.551	0.559	0.568	0.560	0.566	0.566	0.545	0.562	6.984

*tests averaged. *Includes Fiat tests before Hesston-Fiat. **Includes tests for White, Minneapolis-Moline and Oliver.*

did almost 3 and 5 percent better respectively, and overall Deere fuel use improved about 9 percent compared with 1979-81 and 7.5 percent compared with 1959-81 tests.

Ford 2WDs used 3.2 percent less fuel in 1982-86 than in 1979-81, but 2.5 percent more than they burned in 1959-81 tests. Eight of the 20 least fuel-efficient tractors in 1982-86 were Fords, all Japanese imports.

Three **Hesston** tractors were in the 21 most efficient 1982-86 models, but Hesston's average slipped slightly from 1979-81 performance levels.

Kubota efficiency improved 8.7 percent from 1979-81 to 1982-86, but the 1959-86 average of 0.583 lbs/hp-hr placed Kubota next to the bottom in company-wide fuel efficiency.

Massey-Ferguson 2WDs burned about 6 percent less fuel in 1982-86 tests than in 1979-81, but still used 4.6 percent more than in the 1959-81 tests, and 12 percent more than in 1959-70, when MF was at the top of the heap in fuel efficiency. Four 1982-86 MF tractors, three of them imports from Japan, were in the 20-least-efficient-models list.

Steiger 1982-86 fuel efficiency improved over 10 percent compared with 1959-81 and 7 percent from 1979-81. But seven of the 15 most recent Steiger tractors tested had no pto, which slightly improved efficiency along with whatever other engineering changes were made to improve performance.

Even with two hydrostatic models tested, **Versatile** tractor efficiency improved 8 percent in 1982-86 versus 1979-81 and 7.5 percent from 1959-81.

White 2WDs in 1982-86 tests used 8 and 5.6 percent less fuel than in 1979-81 and 1959-81 periods respectively. In 1982-86, its 4WD performance was 7.2 and 7.9 percent better than in 1979-81 and 1959-81 tests respectively. White figures include all 1959-86 tests of White, Oliver and Minneapolis-Moline tractors.

Yanmar had the lowest 1982-86 average efficiency. Fuel use ranged from 0.587 to 0.659 lbs/hp-hr. Yanmar tractors ranked 10th, 11th and 16th from the bottom in efficiency. But the Yanmar-built John Deere 1650 had *fifth-best* fuel efficiency—14.97 hp-hrs/gal, 0.467 lbs/hp-hr. (Deere says those tractors are built by Yanmar to Deere specifications.)

Fuel efficiency of two Zetors tested in 1982-86 was 1.3 percent better than the average for five Zetors tested in 1959-70.

HIGHEST AND LOWEST

1982-86 at Nebraska

Highest Fuel Efficiency		Lowest Fuel Efficiency	
Model	HP-Hrs/ Gal	Model	Hp-Hrs/ Gal
Steiger Panther SM325*	15.98	MF 1040	9.53
Versatile 876*	15.68	IH 3488 Hydro	9.73
Steiger Bearcat KM225*	15.28	MF 1030	9.82
Steiger Panther CM360*	15.15	A-C 6140	10.25
John Deere 1650	14.97	Versatile 276 Hydro	10.25
Steiger Bearcat KM325*	14.79	Ford 1510	10.26
Versatile 1150*	14.64	Ford 1510 (Sync)	10.27
Steiger Panther KP1400*	14.54	MF 1020	10.44
Steiger Couger III*	14.40	Ford 1710 (Sync)	10.56
Steiger Couger 1000	14.31	Yanmar 276	10.57
Steiger Cougar 1280	14.30	Yanmar 336	10.66
Steiger Panther KP1360	14.27	Ford 1710	10.76
Hesston 180-90	14.25	Ford 1910 (Sync)	10.78
JD 4050 Quad Range	14.25	Ford 1910	10.86
Hesston 80-66	14.21	MF 3505	10.90
John Deere 2755	14.19	Yanmar 226	10.93
Steiger Panther KP1325	14.15	Ford 2110	10.95
Steiger Panther CP1400*	14.12	Versatile 256 Hydro	11.07
Versatile 836	14.11	Ford 2110 (Sync)	11.11
Hesston 80-90	14.09	Kubota 4950	11.15
Versatile 936*	14.04		
Average	14.56		10.54

**No pto, drawbar test only.*
Source: Nebraska Tractor Test Reports, University of Nebraska, Lincoln, Neb.

Conclusions

Despite arguments of some experts, our earlier analysis did not show significantly better fuel efficiency for 4WDs than for 2WDs. But in the latest period, all 4WD lines did better, with average 4WD fuel use up almost 9 percent from 1979-81 tests and 9.3 percent above the 1959-81 average. Since not all 4WDs are designed for or have been tested under the same conditions, no effort was made to compare performance at reduced engine speed, where some tractors operate more efficiently and develop more power than they do at rated engine speed.

Some claim that fuel efficiency varies by size of tractor. Louis Leviticus, Nebraska Tractor Test Lab chief engineer, says, "There are quite significant differences below and above 40 hp. The efficiency stays about the same up to 90 hp, then between 95 and 120 hp we again see a loss of efficiency. From about 120 until 180 hp, the efficiency is again better and about even, and again between 280 and 220 hp the efficiency goes down."

The general pattern Leviticus describes seems to fit 1982-86 2WDs.

The 20 least efficient tractors in the 1982-86 period include 16 Japanese-built models. Is it to be assumed that Japanese tractors are less efficient than North American and European models? Not really.

In the under-50-hp class, 28 Japanese-made models used 10.3 percent more fuel per hp-hr than non-Japanese tractors in that power group. But that 62-hp Deere 1650 from Japan had the fifth-best fuel efficiency.

That's not all: 12 Japanese tractors in the 50-99 hp class used 4.2 percent less fuel than the 47 non-Japanese models of that size and averaged 16 percent less fuel than their smaller Japanese counterparts. The entire 50-99 hp class was, on average, 10 percent more efficient than the under-50 tractors. It raises some questions.

For instance, does this mean that Japanese as well as Europeans and Americans know how to build efficient small tractors—but *don't*? Do we assume that the relatively small volume of fuel burned by small tractors is unimportant? That logic fails when one 49-hp Japanese tractor can burn 3.495 gal/hr in the 75 percent maximum drawbar load test compared with 3.717 gal/hr (6 percent less) for a 75-hp tractor from the same manufacturer. Overall, the 21 most efficient tractors burned about 28 percent less fuel per hp-hr than the 20 least efficient.

Are American tractor buyers and the makers of those tractors ignoring forecasts of long-term energy shortages, as is the case with automobiles? Is it all a search for glamorous gimmicks to distinguish different models? True, most recently-added features improve operator comfort or tractor performance, but many of today's smaller tractors don't offer much more than those of three decades ago, yet burn more fuel.

Is it any wonder that 30- to 50-year-old small tractors still sell for more than their last list price? Will demand for today's tractors be that good when (and if) they reach the same age? □

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I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

The business magazine of the farm and industrial equipment industry

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I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

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May 1989 • Vol. 104 • No. 6

On Our Cover

Jimmy Rogers and his daughter, Laurie Lowe, moved their South Carolina dealership from auto parts to outdoor power equipment. When horse and livestock farming developed in their area, they grew into the new market.

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12: **Hay Growing:** Some farmers are deserting their traditional row crops for hay. Some hay tool specialist talk about the opportunities.

16: **New Power:** A look at some of the arrivals to the industrial, ag and utility markets.

21: **Tractor Importers, Part IV:** The offbeat, medium-sized tractors from other than the major industrial nations are doing okay in America, as government data indicate. Profiles of CBT and SAME.

23: **Losing Our Bearings?** Shortliners are feeling the pinch on the supply side lately, but it hasn't been easy for the majors, either.

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March Retail Sales: Positive-Negative Mix

U.S. retail sales of farm equipment in March, according to the Farm & Industrial Equipment Institute's monthly flash report, showed sales improvements in most tractor categories, while sales of combines remained depressed and some hay tools were off sharply. For the first quarter, the only sharp declines were in sales of under-40-hp tractors and self-propelled combines.

UNIT RETAIL SALES

Equipment	March 1989	March 1988	% Change	January-March 1989	January-March 1988	% Change
Farm Wheel Tractors						
2-Wheel Drive						
Under 40 HP	3,969	4,744	(16.3)	8,420	10,493	(19.8)
40 & Under 100 HP	3,269	3,190	2.5	7,592	7,749	(2.0)
100 & Under 140 HP	536	417	28.5	1,270	1,167	8.8
140 HP & Over	1,363	1,090	25.0	3,673	2,922	25.7
Total 2-Wheel Drive	9,137	9,441	(3.2)	20,955	22,331	(6.2)
4-Wheel Drive						
Under 200 HP	112	140	(20.0)	303	252	20.2
200 HP & Over	276	226	22.1	638	439	45.3
Total 4-Wheel Drive	388	366	6.0	941	691	36.2
Total Farm Wheel Tractors	9,525	9,807	(2.9)	21,896	23,022	(4.9)
Combines (Self-Propelled)	317	579	(45.3)	878	1,401	(37.3)
Rectangular Balers	285	275	3.6	836	632	32.3
Forage Harvesters (Shear Bar Type)	85	102	(16.7)	251	252	(.4)
Mower Conditioners	477	692	(31.1)	1,375	1,346	2.2

MF, Claas Cut Deal on Conventional Combines

Massey-Ferguson and Claas oHG of West Germany have signed a joint supply and distribution deal covering two conventional combines in the Class V and Class VI sizes. The MF-branded combines will be distributed by the Massey dealer organization in North America.

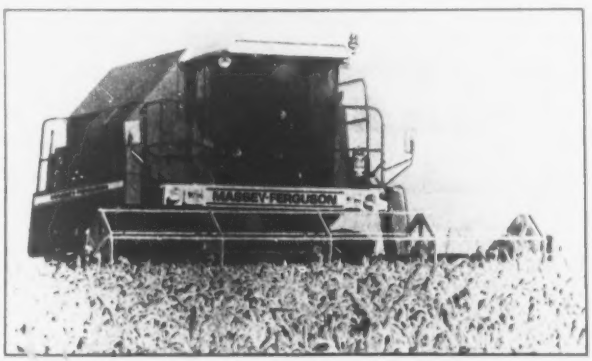
Claas will continue marketing its products in North America under its own name from its Claas of America subsidiary based at Columbus, Ind. They include conventional and non-conventional combines, balers and other hay tools.

MF says the 8450 (Class V) and 8460 (Class VI) will be available for midsummer delivery.

Both combines have hydrostatic drive. The 8450 is powered with a 346-cu.-in. diesel engine rated at 162 horsepower; tank capacity is 150 bushels. The 8460 has a 669-cu.-in. diesel developing 221 hp. Tank size is 185 bushels. On the 8450, the variable-speed cylinder is 52 in.; on the 8460, it is 62 in..

Rigid grain heads are available in cutting widths of up to 30 ft. Flexible bottom heads go up to 20 ft. Six- and eight-row corn heads are also available.

Earlier, MF had introduced a Class IV conventional combine to its dealers made at its combine facility in Brazil.



FIEI to Expand Construction Services

The Farm & Industrial Equipment Institute will expand its statistical, technical, government relations and general representation services to encompass construction equipment manufacturers.

According to a statement by FIEI Chairman John Tye, Tye Co., there have been efforts for several years to merge the FIEI and the Construction Industry Mfrs. Assn. Three proposals developed by joint FIEI-CIMA task forces have been turned down by the CIMA board, the most recent last Nov. 1.

Subsequently, several companies belonging to both groups petitioned the FIEI to expand services to include a full range of construction type products. According to the Tye statement, they wanted to invest their effort in one trade association for farm, industrial and construction equipment makers.

In February, the FIEI board instructed its staff to develop an expansion program in line with the petitioners. In March, the CIMA board developed and voted its own plan for a merger. The FIEI board, however, instructed its staff to continue the expansion of its programs "and revisit the merger issue at a more appropriate date in the future."

The FIEI board instructed the staff and officers of FIEI to implement the proposal made to the construction equipment manufacturing firms, and to develop restructuring plans for FIEI to be considered in August. The resolution also instructed Tye to notify CIMA that FIEI will not engage in further merger discussion until the expanded programs are operative and structural changes desired by the membership are in place.

The Tractor Importers, Part IV:

Independents Mount Impressive Numbers

The offbeat, medium-sized tractors from other than the major industrial nations are doing okay in America, as government data indicate. Here are the figures and profiles of a couple of the players.

By BILL FOGARTY

THE TABLE with this article sums it up well. Tractor imports from non-multinational companies are picking up steam.

South Korea, for instance, moved from supplying a few dozen units in 1985 to over a thousand last year; Yugoslavia went from zero to over 1,600 in the same period.

It has been happening because of currency shifts in world commerce and the deepening of the part-time farm market in the U.S. Importers and their dealers have been telling *I&T* that they are responding to a demand by smaller operators for competitively priced tractors with few frills.

This in turn suggests two changes in the U.S. market.

One, the once lavish supply of used middle-sized tractors, some of them over 20 years of age, is at last going into a natural decline. It is said that old tractors never die, but it may be that the cost of keeping some of them running has become expensive enough that the alternative of a com-

(More, next page)

Independent Tractor Importers: They're Getting Busier

(Number of units imported to U.S. from selected nations)

Country of Origin	1985	1986	1987	1988	Four-Year Total
Brazil	56	95	245	1,373	1,769
China	20	16	43	205	284
Czechoslovakia	591	891	743	1,140	3,365
Italy	3,241	5,299	3,963	1,576	14,079
South Korea	63	535	686	1,072	2,356
Poland	1	0	49	73	123
Romania	1,186	495	1,432	1,363	4,476
Soviet Union	406	1,214	1,448	3,180	6,248
Yugoslavia	0	204	1,368	1,605	3,177
Totals	5,564	8,749	9,987	11,587	35,887

Source: U.S. Dept. of Commerce

Interpreting this table: These are the primary countries of origin for tractors brought into the U.S. by the independent tractor importers who are the subjects of this series of articles. However, they are not responsible for all tractor imports shown in this table.

For example, Brazilian tractors are brought in by two independents, CBT and Viking, and by two multinational companies, Massey-Ferguson and Ford. From Italy come Hesston's Fiat tractors and SAME units. MF had sourced its Landini tractors from Italy and is now sourcing some tractors from Poland, as is Ursus Midland.

Other tractor makes and their origins: Zetor from Czechoslovakia; Kioti from Korea; Universal and Long from Romania; Belarus from the Soviet Union; MEMO and IMT from Yugoslavia.

Other major source nations for tractor imports, Japan, Canada, U.K., West Germany and France, are not included in this table because their activity is almost totally involved with major, multinational companies: Case, Deere, Deutz-Allis, Ford New Holland, Kubota and Massey-Ferguson.

IMPORTS *(from page 21)*

petitively priced new unit provided by an independent importer is compelling.

Two, part-time or small farming operations, typical users of middle-sized tractors, from 40 to 99 horsepower, are apparently expanding in number, at least enough to soak up the available supply of used units to a substantial degree.

In prior articles in this series, *I&T* has profiled several of the importers and their products: February—Robison & Woods, importers of the IMT from Yugoslavia; March—Long Mfg., longtime marketer of Romanian-built Universal tractors under the Long name; April—MEMO from Yugoslavia; Kioti from Korea; Universal Farm Group's Romanian Universals; and Zetor from Czechoslovakia. Let's look at a couple more now.

CBT has targeted buyers who want low-price, basic tractors that are also highly reliable.

CBT from Brazil

CBT stands for Companhia Brasileira de Tractores and was founded in Sao Carlos, Brazil, in 1960. Originally, tractor models were licensed from Oliver Corp. (which eventually became part of what is now White-New Idea). In a few years, CBT models began evolving from the Oliver design into what has become today's line.

CBT makes five models from 70 to 111 pto horsepower and according to the U.S. distributor, CBT-USA of Colorado Springs, Colo., additional models are to be added in the next two years to broaden the range to from 40 to 135 pto hp.

In the early 1980s, CBT brought a tractor line that was "sixties-looking," says Gregory M. Lattimer, CBT-USA president, and made a test-marketing effort in Florida. Several units were sold, but CBT decided to withdraw and restyle. The result is the 8060 series.

CBT models now on the U.S. market are: Two- and front-wheel-drive versions of the 8260, developing 111 pto hp and driven by a Perkins 6-354.4 diesel engine, weighing 11,041 lbs.; two- and front-wheel-drive versions of the 8060, 108 pto hp, Mercedes-Benz 6-cylinder, 346.3-cu.-in. displacement engine; also weighing 11,041 lbs.; and the 8240, 70 pto hp, Perkins 248-cu.-in. displacement diesel. All are equipped with a mechanical transmission having six forward and two reverse speeds.

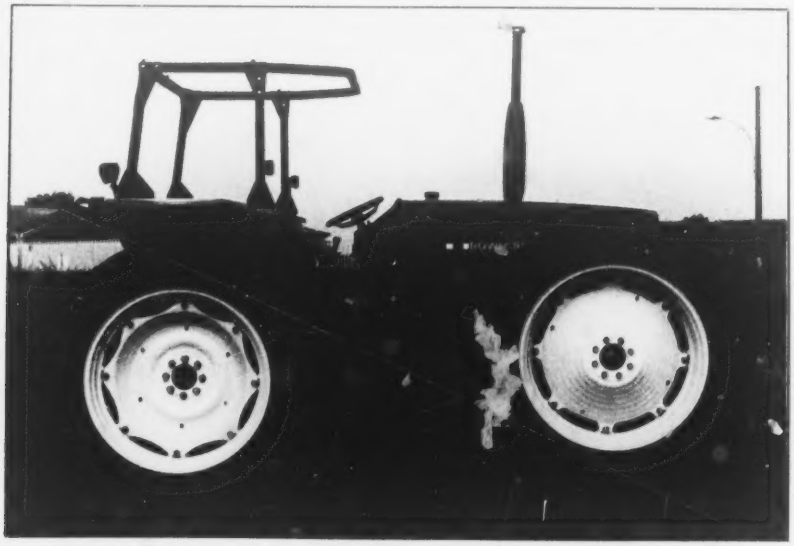
According to Lattimer, the company also intends to import an articulated four-wheel-drive tractor in June, "a Steiger that went to Brazil," that is more basic and less expensive than North American-made offerings, "but also very reliable, not just cheap."

Lattimer says his company is betting that there is a substantial market in the U.S. not only for a low-price, basic tractor but also for one that is highly reliable. "Many of the dealers we are talking to have a major franchise, but they are also looking for a back-to-basics type that can satisfy certain customers. And some dealers who handle East European tractors are looking for something like our units to compete against the major's lower cost market segment."

He adds: "We feel another big market is the corporate farmer who uses hired labor to operate his tractor fleet. This is the kind of market the tractor was designed to satisfy in Brazil. They can't hurt the tractor, but if anything goes wrong, they can fix it themselves."

Other CBT-USA officials are C.H. McAllister, chairman; John Griffis, treasurer; Dave Dairy, director of marketing; and Byron LeBlanc, product development director. The company has a port-

(See IMPORTS, pg. 27)



SAME changed its approach to the U.S. market from offering a broad range of tractors to being a niche-oriented specialist.

IMPORTS *(from page 22)*

of-entry facility at New Orleans, and ROPS, ROPS cabs and tires, made in the U.S., are added.

SAME from Italy

SAME began 62 years ago in Treviglio, Italy, and started U.S. activity in the 1970s. When the industry went into its worldwide decline, SAME "mothballed" its American subsidiary, according to Claus Morch, who manages the company's U.S. operations as a manufacturer's representative from Berkeley Heights, N.J.

A change in SAME's floorplanning led to a sharp decline in dealer numbers from a peak of 176 to as low as six. But significantly, the company changed its approach to the U.S. market from one offering a broad range of tractors powered by air-cooled diesels to a niche-oriented specialist.

Today, there are 30 SAME dealers. They are found in Wisconsin, Minnesota, Florida, the northeast, the Rio Grande valley of Texas, Arizona and California. The specialty is "the Mudder," and Morch says that SAME is No. 1. Mudders are so called because vegetable growers need tractors which can pull wagons loaded with boxed vegetables out of the field, and these fields are often very muddy at harvest because of recent flood irrigation applications.

"In 1988," says Morch, "270 SAMEs were sold, primarily specialty units for vegetables and the balance all 4WD units from 80 to 170 horsepower."

A mudder such as the Row Crop 85 is powered by a SAME-made air-cooled diesel developing 83 engine hp at 2300 rpm. Speed as low as a fourth of a mile per hour is attainable in the special gear box, which offers 16 forward and 16 reverse speeds. Morch says the 85 was designed specifically for this job and is not a normal utility tractor with add-ons. "The front and rear axles are specifically built to get out to 80 inches," Morch says, "not standard axles with extended housings that can result in incorrect king pin angle, increased tire wear, breakage, etc."

He asserts that SAME will continue to protect its niche in the mudder market, which has attracted the interest of some U.S. companies. "We have a new mudder prototype arriving soon (pictured). We will expand into other areas, such as 90-pto-hp, 4WD, low-profile sprayer tractors for almonds, citrus, etc.; vineyard tractors of 60 to 75 hp that go down to 39 inches in width; and ag crawlers of 55 to 80 hp in various widths."

Still more to come

There are more precincts to be heard from. In a later issue *I&T* will take a look at some additional entries from abroad and comment on the direction in which some of the tractor importers may be taking the market. □

NEW POWER *(from page 17)*

orchard and nursery operators, according to Wilfred Boyle, MF product marketing manager.

Like most MF tractors, it is powered by a Perkins diesel engine, has standard hydrostatic steering, disk brakes and heavy-duty planetary rear axle. The 253 is available both as a standard or as a low-profile unit with either 8-speed or manual shuttle transmission.

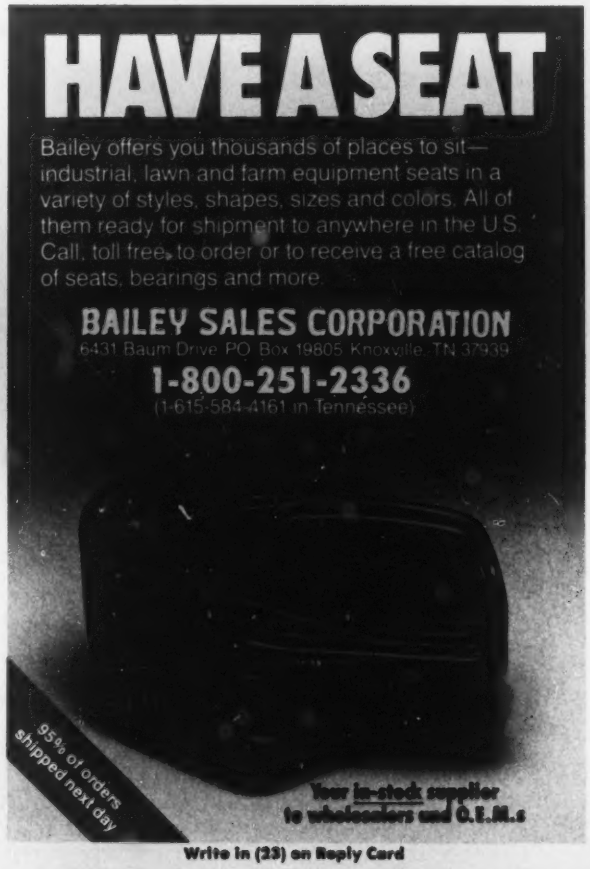
Case Upgrades 680, 780 Models

J I Case says that its new loader-backhoes, the 680L and the 780D, which succeed the 680K and the 780C, increase operator productivity and retain the features of their predecessors.

On the 680L, new features include a four-wheel-drive option, 39 percent more swing torque on the backhoe; upgraded electrical and hydraulic systems; outboard wet disk brakes; a 50 percent larger cross

member on the loader; a 6-cylinder, 90 SAE net horsepower diesel engine (with 6.3 percent more power); an upgraded 65-ampere alternator and two 12-volt batteries.

Case says the 780D, with an engine of 112 SAE net horsepower and a four-wheel-drive option, has increased ground clearance, a stronger steering assembly, differential lock and a 21 percent increase in swing cylinder torque. Other improvements cited by Case include a hydraulic brake system which replaces air-activated brakes and a drum and shoe parking brake. The electrical system has been changed from 24 to 12 volts to improve reliability and standardization.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I&T 100 YEARS OF LEADERSHIP

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June 1989 • Vol. 104 • No. 7

On Our Cover

A dealer's guide to working the Louisville Expo: I&T gives its readers some advance tips on how to maximize the time, where to hunt for hot products of the future, all from a veteran showgoer.

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FEATURES

10 **CHAIN SAWS:** Go for the pro. Sure, chain saw unit sales are half the volume of their frenzied peak year, but marketers and retailers with strong service orientation seem to hold their own, maybe increase their shares.

13 **SHOP PRODUCTIVITY:** Diesel service specialists talk about ways they maintain excellence in their shop operations.

18 **WHO'S EXHIBITING** at Louisville? Here's a listing of everyone who's putting best-foot-forward at the International Lawn, Garden & Power Equipment Expo July 31-August 2. This issue will be packed in many Kentucky-bound dealers' briefcases as the list is used to plan three days of strategic shopping.

26 **PARIS SHOW:** Americans get limelight. A few years ago, it wouldn't have happened. But I&T's man in Western Europe, Mike Williams, found U.S.-made major products drawing a lot of attention at the world's biggest farm equipment event.

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U.S. April Sales Up In Most Categories

U.S. retail sales of farm equipment were up in all categories but one, according to the monthly flash report of the Farm & Industrial Equipment Institute. Only tractors under 40 hp declined in April, and this group declined a sharp 31 percent. After several months of sluggish performance, self-propelled combines experienced a strong sales surge in April.

UNIT RETAIL SALES

Equipment	April 1989	April 1988	% Change	January-April 1989	January-April 1988	% Change
Farm Wheel Tractors:						
2-Wheel Drive						
Under 40 HP	5,568	8,030	-30.7	13,994	18,523	-24.5
40 & Under 100 HP	3,887	3,303	17.7	10,987	11,053	-0.6
100 & Under 140 HP	540	517	4.4	1,809	1,684	7.4
140 HP & Over	1,855	1,063	74.5	5,530	3,985	38.8
Total 2-Wheel Drive	11,850	12,913	-8.2	32,820	35,245	-6.9
4-Wheel Drive						
Under 200 HP	108	84	28.6	411	336	22.3
200 HP & Over	399	160	149.4	1,037	599	73.1
Total 4-Wheel Drive	507	244	107.8	1,448	935	54.9
Total Farm Wheel Tractors	12,357	13,157	-6.1%	34,268	36,180	-5.3
Combines (Self-Propelled)	368	182	102.2	1,246	1,583	-21.3
Rectangular Balers	508	390	30.3	1,339	1,022	31.0
Forage Harvesters (Shear Bar Type)	112	106	5.7	362	358	1.1
Mower Conditioners	908	820	10.7	2,270	2,166	4.8

Analyst Likes Allied's Ag Equipment Outlook

Earnings per share of Allied Products Corp., parent company of White-New Idea, Kewanee and Bush Hog, is expected to increase its earnings per share from 1988's 74 cents to $2.35 in 1989, $3.00 in 1990 and $4.00 in 1991. That's the view of Mitchell Quain of Wertheim Schroder, New York financial house.

Farm equipment operations accounted for 48 percent of Allied sales in 1988 at $278 million and 78 percent of its earnings. Sales are estimated to move to $305 million this year, $336 million in 1990 and $370 million in 1991. Total Allied sales last year were $578 million.

Within Allied's farm equipment group, White-New Idea contributes 35 percent of both sales and earnings, in Quain's estimate, while Bush Hog provides an estimated 20 and 30 percent respectively of sales and profits. Kewanee is credited for 5 percent of sales and profits.

Gehl Sales in 1988: $125 Million

Gehl Co. has announced that its net sales in fiscal 1988 were $124.6 million, a company record. The company reports that this is a 51 percent increase in sales over the previous year and is the third such increase in as many years.

According to Bernard Nielsen, Gehl president and chief executive officer, industrial equipment sales are now contributing nearly 30 percent to the company's volume. Agricultural equipment sales were up 32 percent, according to the company, or to about $85 million. Export sales volume was reported up by 79 percent.

Case Earns $24 Million In 1st Quarter

J I Case Co. had an operating income of $24 million in the first quarter of 1989, compared with a loss of $60 million in the same 1988 period on a restated basis. (A new accounting rule requires consolidation of the finance companies of Tenneco, Case's parent firm.)

Excluding the effect of this restatement, Case's first quarter operating income improved by $88 million—from a loss of $83 million in 1988 to an operating profit of $5 million in 1989.

In 1988, Case sales were $4.3 billion, compared with $3.7 billion in 1988. Losses, before interest and taxes, were $139 million in 1988 prior to adopting the new accounting rule; after, they were $59 million. This includes a charge of $44 million related to disposal of Case's South African operations.

Tenneco Inc. reported first quarter total net income of $109 million compared with $10 million a year earlier. Total revenues were $3.3 billion, topping the same 1988 period by $26 million.

Canadian Sales Mixed Through April

Canadian farm equipment sales were mixed in the first four months of 1989, says the Canadian FIEI. Tractor sales were up 1 percent to 4,891 units despite a 10 percent drop in under-40-hp volume to 940 units. Sales of over-100-hp tractors were up 11 percent to 892 units; four-wheelers were up 37 percent to 458 units. Self-propelled combine sales were down 45 percent to 147 units.

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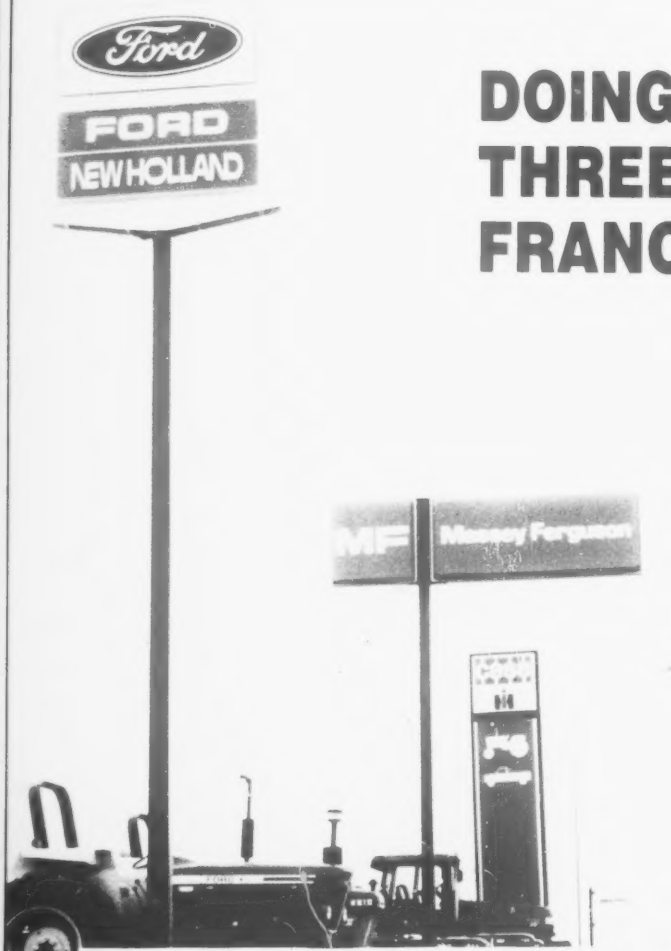
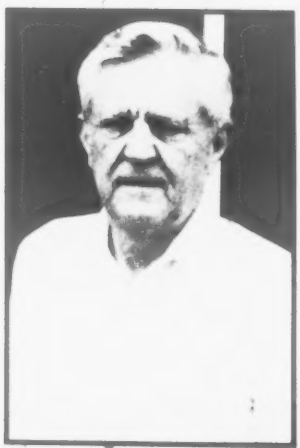
DOING FINE WITH THREE MAJOR FRANCHISES

page 12





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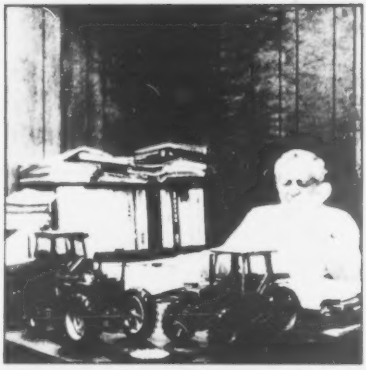

On Our Cover

Ag changes of the 1980s have made the once-rare multi-franchise dealership commonplace today. H.H. Halferty & Sons relies on talented service people and a flexible sales team to represent its suppliers well.

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9: **SEARCH FOR NEW PRODUCTS:** We're always practicing 'what's new,' says Arizona dealer Norm Bingham. It's more demanding than it once was, but it's necessary if you're going to keep up with the marketplace.

15: **COMPANY STORES OUT:** The merger of Ford and New Holland brought two contrary policies about retail operations into play. Here's how FNH marketers took the route they did.

17: **MEETINGS AND SHOWS:** Details on conventions, meetings and equipment shows for the coming year.

23: **STRIPPER HEADER:** Today's combine may be costly and hard to transport, and sales volume will never be what it once was. Here's a report on some American reactions to Britain's stripper approach, plus a response.

26: **TELESCOPIC BOOM:** Will this machine find a home on American farms? A British company is betting yes. American manufacturers are not planning to try, at least not yet. A market to watch.

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May U.S. Retail Sales: Strong Comeback in Most Product Groups

Retail sales of farm equipment in the U.S. came on strong in May, according to the flash report of the Farm & Industrial Equipment Institute. Sales were up in all categories except tractors under 40 hp. Sales of tractors over 100 hp, including both two-wheel and four-wheel-drive types, were up by 36 percent for the first five months of 1989 to 10,609 units. Most of these units are manufactured in North America.

UNIT RETAIL SALES

Equipment	May 1989	May 1988	% Change	Jan.-May 1989	Jan.-May 1988	% Change
Farm Wheel Tractors						
2-Wheel Drive						
Under 40 HP	5,601	6,301	-11.1	19,749	24,824	-20.4
40 & Under 100 HP	3,447	3,059	12.7	14,941	14,112	5.9
100 & Under 140 HP	475	332	43.1	2,287	2,016	13.4
140 HP & Over	1,097	666	64.7	6,626	4,651	42.5
Total 2-Wheel Drive	10,620	10,358	2.5	43,603	45,603	-4.4
4-Wheel Driver						
Under 200 HP	95	78	21.8	506	414	22.2
200 HP & Over	252	129	95.3	1,289	728	77.1
Total 4-Wheel Drive	347	207	67.6	1,795	1,142	57.2
Total Farm Wheel Tractors	10,967	10,565	3.8	45,398	46,745	-2.9
Combines (Self-Propelled)	441	206	114.1	1,685	1,789	-5.8
Rectangular Balers	816	696	17.2	2,155	1,718	25.4
Forage Harvesters (Shear Bar Type)	233	197	18.3	593	555	6.8
Mower Conditioners	1,942	1,658	17.1	4,204	3,824	9.9

Deere Campaigns Against Bypass Starting

Deere & Co. has launched a campaign against bypass starting of tractors which includes a decal and a free solenoid cover for most Deere tractors built since 1960.

According to Dave Schmerse, project manager for product safety marketing and training, everyone on the North American mailing list for Deere's *The Furrow* magazine received a letter with an enclosed decal (shown here). The letter warns of the danger of bypass starting, which includes such practices as shorting across the starter or starting with the key while standing on the ground.

Schmerse said that Deere dealers have been supplied with solenoid covers and a video which is designed to explain the hazards of bypass starting to customers.

There are eight cover designs to fit 50 different starter configurations on Deere tractor lines introduced from 1960 to the present, he added. Tractor owners are urged to attach the decal on or near the tractor's starter.

Briefly...

Kubota Manufacturing of America has begun producing loaders at its new factory at Gainesville, Ga., and is now exporting loaders to Canada, Australia, England and France as well selling in the United States. It is the first manufacturing facility in the United States for Kubota.

MF Sales Down In 1st Period

Sales of Massey-Ferguson farm and industrial equipment in the first fiscal quarter, ended April 30, were down $24 million to $294 million, according to its parent, Varity Corp. Varity reported a net profit of $16 million on sales of $503 million compared with $15 million on sales of $540 million in the same period a year ago.

Perkins Engines, another Varity operation, had a sales increase of $3.5 million to $141 million in the period.

D-A's Tweedy Wins Case-McCormick Gold Medal Award

Robert H. Tweedy, senior product development engineer for Deutz-Allis Corp., Atlanta, Ga., has received the 1989 McCormick-Case gold medal award of the American Society of Agricultural Engineers. The medal goes annually to an ASAE member for "exceptional and meritorious engineering achievement in agriculture."

Tweedy

Tweedy received the award for "his vision and engineering contributions in the area of conservation tillage equipment systems."

A past president and fellow of ASAE, Tweedy holds several patents and has authored over 40 publications.

ASAE noted that he has "consistently contributed to the improvements and excellence of agricultural engineering endeavors and has been a strong sponsor of conservation, tillage equipment and practices."

I&T 100 YEARS OF LEADERSHIP

Implement & Tractor

The business magazine of the farm and industrial equipment industry August 1989

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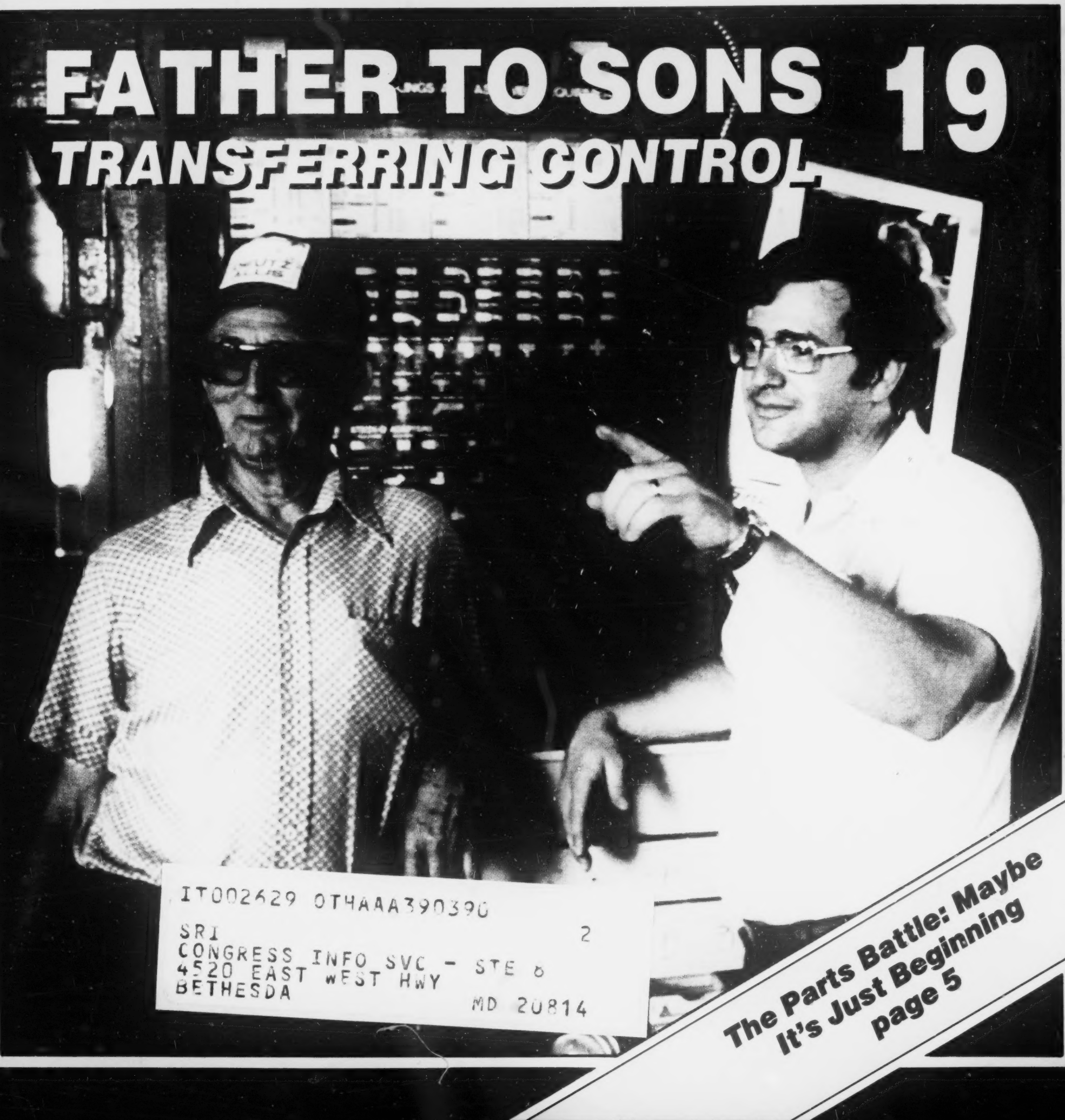

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On Our Cover

Many dealers have had problems turning control of the business over to their designated successors. But they've made the change successfully at Arthur Ring & Sons.

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Midyear Retail Sales: All But One Product Area Up

Only tractors under 40 horsepower showed a decline in the first six months of 1989, according to the Farm & Industrial Equipment Institute's monthly flash report. All other product groups have experienced increases for the first half.

Self-propelled combines took a major sales increase in June, raising the year's total to 2,447 units, up 7 percent on 1988's first half.

UNIT RETAIL SALES

	June			Jan.-June		
Equipment	**1989**	**1988**	**% Change**	**1989**	**1988**	**% Change**
Farm Wheel Tractors:						
2-Wheel Drive						
Under 40 HP	6,188	7,229	-14.4	26,066	32,053	-18.7
40 & Under 100 HP	3,967	3,638	9.0	18,814	17,750	6.0
100 & Under 140 HP	438	312	40.4	2,723	2,328	17.0
140 HP & Over	861	710	21.3	7,479	5,361	39.5
Total 2-Wheel Drive	**11,454**	**11,889**	**-3.7**	**55,082**	**57,492**	**-4.2**
4-Wheel Driver						
Under 200 HP	96	103	-6.8	602	517	16.4
200 HP & Over	216	162	33.3	1,505	890	69.1
Total 4-Wheel Drive	**312**	**265**	**17.7**	**2,107**	**1,407**	**49.8**
Total Farm Wheel Tractors	**11,766**	**12,154**	**-3.2**	**57,189**	**58,899**	**-2.9**
Combines (Self-Propelled)	762	499	52.7	2,447	2,288	6.9
Rectangular Balers	1,383	1,436	-3.7	3,430	3,154	8.8
Forage Harvesters (Shear Bar Type)	428	423	1.2	1,020	978	4.3
Mower Conditioners	3,172	2,745	15.6	7,372	6,569	12.2

Caterpillar Forms New Ag Unit

Caterpillar Inc. has announced that it has formed a new agricultural business unit. It will be responsible for the design, manufacture and marketing of the company's agricultural products, including the Challenger 65 tractor. Heading the business unit is James A. Bockhaus, who has been general manager of Caterpillar's Service Technology Group.

Bockhaus, a 30-year Caterpillar veteran, will report to executive vice president Glen Barton.

A Caterpillar spokesman said that a larger version of the Challenger tractor is being researched for introduction at a later date. Essentially, the Challenger is the only specifically agricultural machine the company sells, though some of its basic construction crawler tractors are modified for agricultural applications. All Caterpillar distributors are eligible to sell the Challenger, the spokesman said, though not all of them do so.

U.S. Pavilion Set for Soviet Expo

The U.S. Department of Commerce has announced that it will have a pavilion at Selknozteknika-90, an exhibition of farm machinery and instruments in Moscow, USSR, Sept. 4-13, 1990. The exposition is organized by Expocentr of the USSR Chamber of Commerce.

According to an Expocentr release, major thematic sectors of the exposition include "tillers and implements, chemistry in agriculture, land reclamation equipment, small mechanization, grass and forage harvesting, cut-grass fodder production, agro-industrial associations livestock equipment, research in tractor and farm machine building, and reforestation machinery."

For further information, contact Mary Wiening, U.S. Department of Commerce, Room H-2102, Washington, D.C., telephone 202-377-4708.

Canada Midyear: Ups and Downs

Retail sales of farm equipment in Canada, as reported by the Canadian Farm & Industrial Equipment Institute, have shown strength in some product areas and declines in others. For the first six months of 1989, sales of tractors under 40 hp were down 4.8 percent to 2,062 units; 40-99 hp tractors, down 11.6 percent to 3,990 units; two-wheelers over 100 hp up 30 percent to 1,475; and four-wheelers up 34 percent to 731 units.

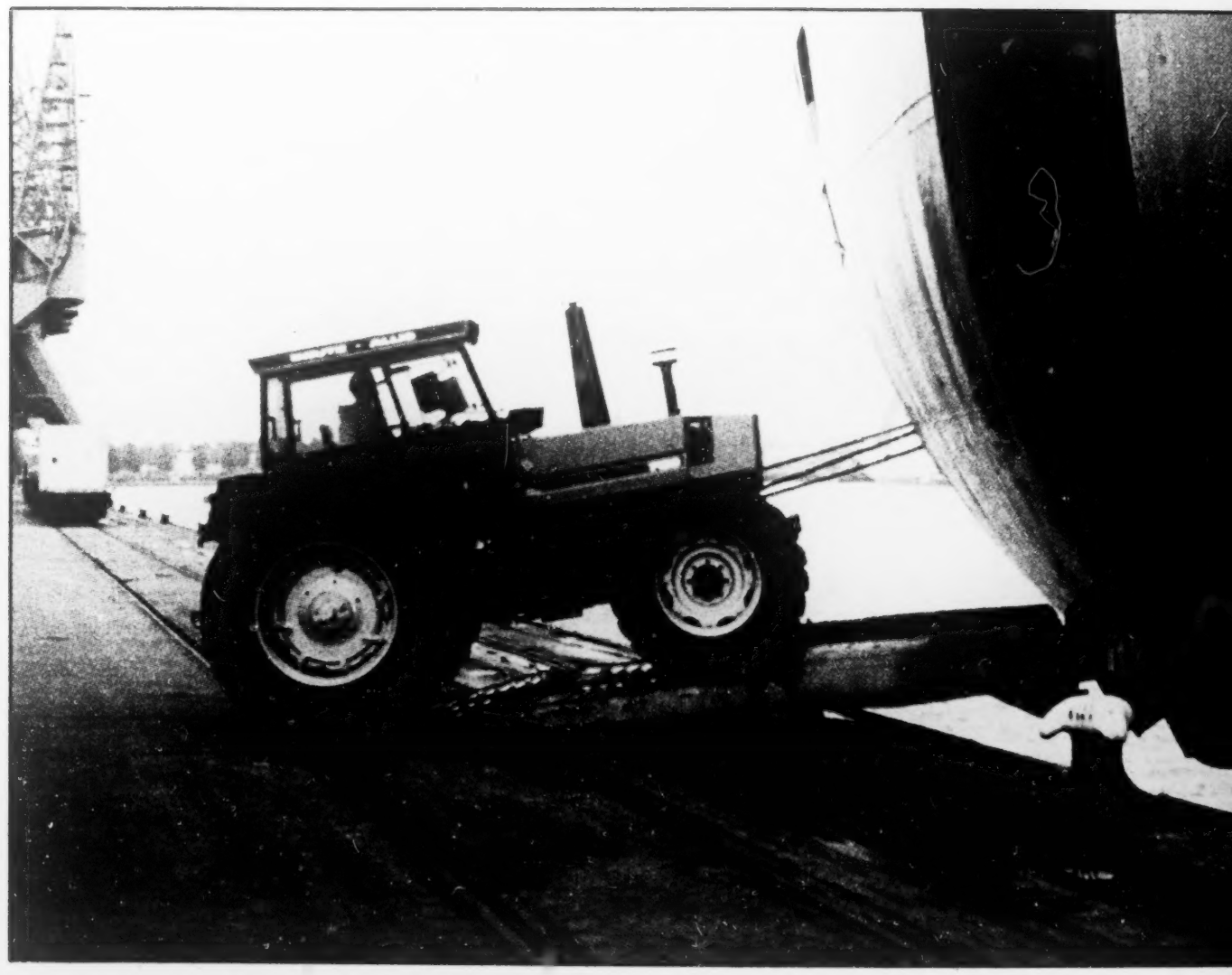
Rectangular baler sales were down 17 percent to 574 units, but round baler volume was up 4.4 percent to 1,338 units. Self-propelled combine sales were off 9 percent to 251 units but pull-types rose by 62 percent to 104 units. Self-propelled swathers went up 38 percent to 219 units; pull-types went up 22 percent to 188. Mower-conditioners went up 2 percent to 1,457 units; forage harvesters were down 14.5 percent to 211 units.

Canadian Forecast: A Good Finish

Canadian farm equipment marketers expect that nation's tractor market to be up in 1989 from 1988 by 3.5 percent to 17,819 units, according to a survey reported by the Canadian Farm & Industrial Equipment Institute.

Tractors under 40 hp are expected to decline by 8 percent from 4,207 units in 1988 to 3,876 this year. Tractors from 40 to 99 hp are predicted to move up slightly from 9,344 last year to 9,517. Two-wheel-drive tractors over 100 hp are expected to increase from last year's 2,333 to 2,876. Four-wheelers are expected to go from 1988's 1,337 to 1,549.

Self-propelled combines are expected to increase in unit sales volume from 1,197 in 1988 to 1,628 in 1989.



We're All In a Global Tractor Market

Doesn't matter if you're a dealer with a 25-mile trade territory or a marketing v-p trying to compete in Latin America with Europeans. It's a one-world industry and its changes will affect you.

By BILL FOGARTY

THE WORLD tractor market has gone through a lot of changes in the past decade. Very interesting, you answer, and go back to thinking about your own business present and future.

Maybe you're a tractor dealer struggling to get a 20-percent tractor market share in a two-county area of Iowa. Maybe you're a district manager for one of the majors, wondering what changes your company might undergo by the start of the 21st Century. Maybe you're a shortline manufacturer wondering how many tractor dealers you can count on to retail your product along with others.

Whatever your situation, it will eventually be touched to some extent by developments elsewhere in the world just within the tractor market. If the company that supplies you or gives you a paycheck can't capture and hold enough of some kind of market share, or if it can't find ways of adapting its assets so that it makes money in a tight, competitive and generally shrinking market, you will be affected.

(More, next page)

GLOBAL *(from pg. 23)*

How much has it happened already? It can be argued that if the world tractor market had stayed as growth-oriented as it was in the 1970s, some of the spectacular consolidations might have happened differently, or not happened.

The growth of the 1970s in the worldwide farm equipment industry was stimulated by unusual demands on world agriculture. Food production had to be raised. This industry responded and delivered a great increase in both tractor units and horsepower. In the process, net factory capacity grew.

In time, food production met and then exceeded demand. The resulting declines in farm prices and income left many tractor producers around the world with excessive, costly capacity.

The situation in the marketplace wasn't quickly recognized. Many companies expected demand to recover in line with cyclical experience. So production wasn't cut sharply enough to match market realities. Surplus inventories thus led to some chaotic marketing practices that hurt the world market players and also the national companies.

The general crunch led to the merging of J I Case Co. and International Harvester's Agricultural Equipment Div.—two world market players. It also affected Allis-Chalmers, which operated as a North American company. A-C was acquired by KHD and placed in its Deutz division, becoming Deutz-Allis.

There are other examples both in the U.S. and Europe.

The world tractor market table does a good job of documenting change in the decade of the 1980s, but it is not perfect. The bottom line—the total—could in fact be deceptive if the table isn't studied carefully.

The total number of units sold in 1980 was 1.284 million and the projection for this year is 1.082 million. That's a decline of under 16 percent over almost a decade, which doesn't sound too painful to adjust to.

But look again at the specific portions of the table which relate to markets served by the major companies. The total tractor market in Western Europe declined by one-third—from 306,000 to 204,000 in the '80s.

The U.S. market has declined numerically more than the table indicates. The 119,331 figure for 1980 does not include tractors under 40 horsepower. At that time, the Farm & Industrial Equipment Institute was not publishing its under-40-hp data because some large players in that market were not part of the reporting program. Today, almost all under-40 units are reported. Adding under-40-hp unit sales into the 1980 total would probably have raised it to 160,000.

Thus, the U.S. farm tractor market has declined by about 31 percent in the '80s, from 160,000 to a projected 110,000 this year.

There are some upbeat parts of the world tractor market. Tractor sales in India have risen from about 17,000 in 1980 to 78,000 today. Turkey has gone from 17,000 to 28,000. Unfortunately, the major tractor firms of Europe, North America and Japan do not participate in these markets, unless some licensing agreements are still in effect.

Also, some major segments of the world market almost totally exclude U.S. and West European manufacturers, most notably Japan and the Eastern Bloc nations.

One industrialized Western nation appears not to have suffered through the tractor market decline of the 1980s: Britain. *I&T* asked its England-based correspondent for Western Europe, Michael Williams, how sales could have remained at the 21,000 level through the 1980s.

"There were some unusual circumstances involved," said Mike. "A law took effect in 1976 that all tractors in use had to have ROPS. This meant that a large number of tractors had to be scrapped, and it set up a market surge that lasted a few years. As an aftereffect of that surge in the late 1970s, market sales went down drastically to the 21,000 level you saw for 1980. Later they rose back into the high 20,000s, then fell below 20,000 and have since recovered somewhat."

(See GLOBAL, pg. 30)

The World Farm Tractor Market

(Unit retail sales by country)

Country	1980	1988	1989**
Belgium, Luxemburg	4,764	3,298	3,300
Denmark	4,082	3,300*	3,300
France	58,784	42,492	38,600
Greece	11,129	4,700*	4,700
Ireland	4,453	2,800*	2,700
Italy	64,998	37,300*	35,000
Netherlands	8,212	6,300*	6,000
Portugal	11,351	6,200*	6,200
Spain	32,187	24,000*	22,000
United Kingdom	21,243	22,000*	21,000
West Germany	45,477	30,463	30,000
Total E.E.C.	**266,680**	**182,853**	**172,800**
Austria	10,423	8,490	8,600
Finland	11,275	6,500*	6,500
Norway	6,000	7,300*	7,300
Sweden	7,704	5,300*	5,500
Switzerland	4,599	4,000*	4,000
Total W. Europe	**306,681**	**214,443**	**204,700**
Eastern Europe	**443,000**	**370,000**	**370,000**
Argentina	6,852	6,700	6,700
Brazil	51,691	38,000*	38,000
Canada	28,825	17,500*	18,000
Chili	1,313	2,000*	2,000
Colombia	1,800	2,500*	2,500
Mexico	18,004	9,800*	9,900
United States	119,331	106,746	109,950
Total W. Hemisphere	**227,816**	**183,246**	**187,050**
Australia	13,915	7,700*	7,600
India	16,840	78,000*	78,000
Japan	131,544	98,000*	98,000
Morocco	2,000	2,300*	2,700
New Zealand	4,000	1,900*	1,900
South Africa	21,166	4,500*	4,500
Turkey	16,840	28,500*	28,000
Others (incl. China)	100,000	100,000	100,000
Total Others**	**306,305**	**320,900**	**320,700**
Total World Market	**1,283,802**	**1,088,589**	**1,082,450**

Source: SYGMA (French Assn. of Farm Equipment Manufacturers). *Estimates by SYGMA. **Forecasts by SYGMA and CEMA, a European federation of farm equipment manufacturers.

GLOBAL *(from pg. 24)*

That "other countries" segment of the table includes not only China, as mentioned, but also such places as Egypt, Venezuela, The Philippines, Thailand and Indonesia. The estimate of 100,000 is, in *I&T*'s opinion, probably too low.

It seems apparent that some of today's world market patterns will continue.

*East European and some Latin American tractor lines will feature intensely price-competitive sales efforts.

*Technology will advance the productive capacity of each tractor so that fewer of them will be needed to meet world agricultural needs.

*Major West European and North American tractor makers will continue to make new alliances with their competitors as a way to cut costs and cover the marketplace. (Example: The Deutz-Allis agreement with White-New Idea whereby White provides high-horsepower units for the D-A line.)

*Small, nationally-oriented companies will not be able to compete with the tractor giants by offering about the same product. They will have to find specialties or niches which will sustain them. (Example: SAME of Italy's solid niche in the "mudder" tractor market of the western U.S.)

*The European Community will go to single market status by the end of 1992. If smaller tractor companies (Fendt, Ebro, Steyr) have trouble finding niches in which to survive, the single market may make it impossible for them to survive in competition with the giants.

*Mergers among major companies are likely to continue. The world market probably doesn't need as many giants as it now has, regardless of the survival status of smaller, nationally-oriented companies. □

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BUTTING OUT *(from pg. 21)*

dividual responsibility. This includes computers in the office and parts department, efficiencies in the shop and more productive sales efforts.

Says Art: "I realize that many dealers and other family business managers have big trouble training their sons or other successors to management levels. I know that when the dealer is no longer in the picture for one reason or another, there is sometimes a vacant spot, a vacuum. The dealer seems unable to let go of the decision-making process, particularly in sales.

"My own experience has proven that a fellow must start early to convince sons or daughters that the equipment business can be not only interesting, but that it can provide a good living."

He offers some advice:

"Try to avoid emphasizing the bad things. Try to point out the pleasures. Try to keep from constantly complaining in their earshot. This should start in early childhood, too. You will all profit in the long run."

His theory seems to have worked for Arthur Ring & Sons, Rushville and Lewiston, Ill. □

RIDGE *(from pg. 15)*

tempted to downgrade ridging as a practice, or refuse to help farmers make a switch. (Some engineers with major manufacturers have been heard to ridicule ridge-tillage, just as they did with four-wheel drive and front-wheel assist until they became popular and accepted enough for the big companies to embrace.)

Later, as they pull their heads from the sand, some of them may note that familiar customers are driving past them to buy from other dealers or put together their own ridging tools.

To whatever extent that happens, it replicates other developments in the history of farm mechanization. If dealers and their suppliers don't help them, they'll help themselves to the savings and other benefits of ridging, somewhere else. □

BOOK LOOKS

1988 Cost of Doing Business Study is the annual operating analysis of farm, industrial and outdoor power equipment dealers across North America. It's published by the North American Equipment Dealers Assn. and is compiled from financial information provided by over 1,000 dealer members. It's the industry standard with regard to dealer-related operational and financial data. Copies are $25.00 each from NAEDA, 10877, 10877 Watson Rd., St. Louis, Mo. 63127-1081, telephone 314/821-7220.

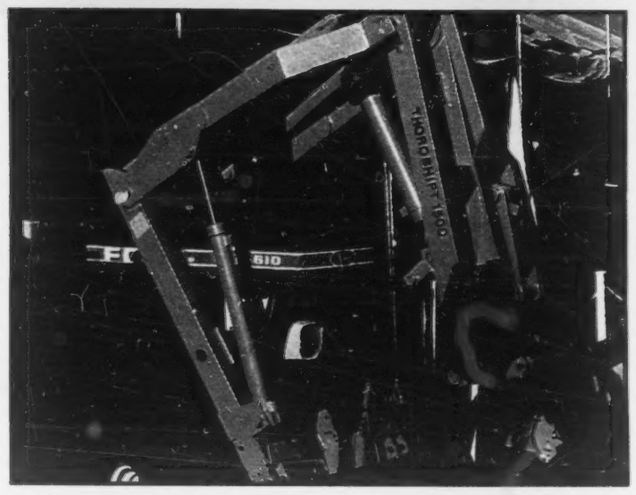
Machinery Fundamentals is published by Salem Co., Box 237, Woodstown, N.J. 08098. Single copies are $25.00 plus $2.00 shipping. It's a course for people without technical training who are involved with mechanical products and whose jobs require reading and understanding product catalogs, parts sheets, assembly drawings, operating manuals and technical specifications. It's said to be useful for customer service persons, phone order-takers, expediters, maintenance workers, sales persons, buyers, administrative workers, etc.

Managing the Sales Territory by Orlan Skare, Skare Instructional Materials, 520 W. 9th St., Willmar, Minn. 56201, $9.95. This is an update and expansion of a previous training manual on sales rep selling. In addition to units on salesmanship, maximizing the order, time management, territory analysis and effective use of the phone, it also looks at selling to a group and at negotiation skills. Each unit is followed by a self-test and a set of discussion questions.

INNOVATION: Alive and Well or Ailing?

IMPLEMENT & TRACTOR

The Business Magazine of the Agricultural, Industrial & Outdoor Power Equipment Industry



VOLUME 104 NO. 10 SEPTEMBER 1989

Dear Reader:

Welcome to your new look **Implement & Tractor**!

No, this is not a one-time "special." Every issue in the future will come to you in this tabloid format that we think will make the publication even more interesting and valuable to you.

We did not make this change easily. After much study and consideration, we became convinced that this format would be the very best way to package the information you want and need in **Implement & Tractor** magazine. But the real "proof of the pudding" will be in what you, our reader and most valued commodity, think about it. If you are inclined and have time to write, we would appreciate hearing your opinion.

While the format is different, we want to assure you that the basic strengths that have kept **I&T** in a position of leadership in the equipment industry for more than 100 years will be maintained and reinforced.

These include the largest circulation and most thorough market coverage of any publication serving the industry, and unsurpassed editorial vitality. You'll continue to get a valuable, highly-readable blend in in-depth features with a full diet of product news to keep you well-informed on what's what and who's who in the industry.

Also, you will continue to receive the highly-respected *Product File* and *Red Book* in October and March, respectively. These valuable annuals will continue to be published in the magazine format.

We appreciate your past reading loyalty and hope you enjoy your "new look" **Implement & Tractor**.

Tommy Keith
President

NAEDA IN BOSTON:
Sales Are Good, Margins Weak

By BILL FOGARTY

HOW CAN margins be so weak when sales are so strong?

Dealers pondered that one continuously as they met in Boston last month to take care of association business. It was the 90th annual convention of the North American Equipment Dealers Assn.

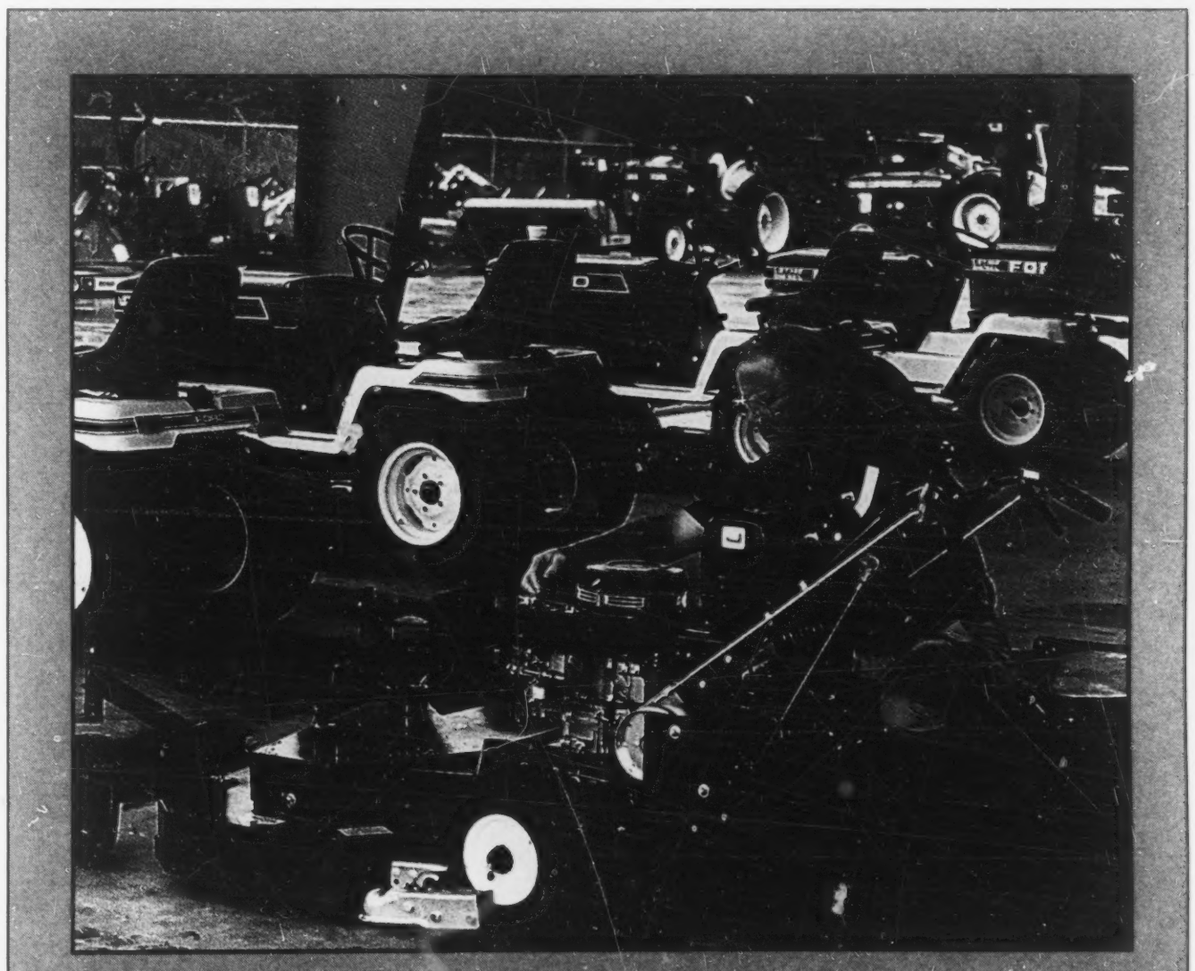
While electing Ron Vavrina, Clarkson, Neb., Deere retailer, as their new president, large numbers of dealers were talking about the apparent paradox of strong demand and fairly tight supplies producing surprisingly thin gross margins.

The NAEDA convention drew about 1,000 registrants, primarily dealers and their families, as well as executives from major supplier companies. The attendance topped the previous year's convention in Vancouver, B.C., by about 100 persons, not a record but an upward trend from recent years.

"The weakness of retail margins is very real," said Vavrina. "They are much lower than anyone had seen, and it's very disconcerting both to dealers and to the manufacturers we talked to."

Vavrina indicated that while the number of dealers in North America has declined considerably in recent years, the number of farmers, particularly those currently in the mar-

(See NAEDA, Page 30)



Commercial Mower Market

KNOXVILLE'S BUDDY COOPER, Ford dealer, moved into the commerical mower market, found it has two levels. See Page 17.

Time for Basic Rethinking on Parts Business

By BILL FOGARTY

Last month, the headline said that the battle for parts market share could be just beginning in this business. We weren't kidding then and nothing has come along in the month since it was written to change this opinion.

What stirred things up? It was the word that at least three investment banking groups were researching the idea of a company that would go after the entire off-highway parts aftermarket.

EDITOR'S NOTEBOOK

Such an enterprise would go after all segments of the parts aftermarket: Farm and industrial equipment, outdoor power equipment, construction equipment, materials handling. It would attack at all levels, dealing directly with end-users, using computer links as well as catalogs, pricing very competitively, sourcing with great clout and ef-

(More, Page 4)

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EDITOR'S NOTEBOOK

Time for Basic Rethinking on Parts

(continued from Page 1)

ficiency, perhaps offering franchises, etc.

Before I heard about that, I thought like most of the people I've talked to in this business. We tend to look at farm and industrial equipment as a universe unto itself.

Same with construction, outdoor power and all the other capital goods fields. Yes, they have their distinctions, but the thing that binds them together is parts.

Manufacturers have to go to vendors for most of what makes up their product line. The manufacturer's design engineers, seeking maximum cost efficiency, tend to specify the most common, standard industrial parts to meet their needs. If they didn't, their products would be too expensive and wouldn't sell.

But the consequence is that there are all kinds of sources at hand when these common parts need replacing.

This situation isn't particularly new. What's relatively new is the explosion of knowledge, of awareness, of information.

Little, small-town auto parts stores found out that they can get a piece of the farm equipment parts market by promoting some of the inventory they already had access to.

Contractors found out they can get undercarriage parts for their construction equipment from sources other than the dealer. Construction equipment parts marketers found out that they can get such parts from many overseas sources.

Computerization and other aspects of electronic communications made a lot of parts business operations feasible, too.

But the parts distribution systems that were set up long ago by wholegoods manufacturers in various fields were based on the premise that all these alternative parts sources were not available, or not known. They were pretty much designed as go-it-alone systems to operate without much substantial competition.

Now that they have the competition, and it's formidable, they must rethink everything.

As I said earlier, I have tended to think of this industry and its parts business as a thing unto itself. And so I've said more than once to anyone who'd listen:

"Take a big distribution town like Minneapolis or Dallas or Columbus. Here are, say, three major farm equipment manufacturers with parts warehouses. Inside each one, there's a long aisle with tubs full of, say, bearings from SKF and Fafnir and others.

"And in each place, a worker goes down the aisle and plucks a specific model bearing from a tub in the process of filling an order. Each one of these workers puts the bearing on a truck. These three trucks then roll down the interstate to a town.

"At this town, each truck drops its bearing off at a different dealership. (Or now, with so much multi-franchising, maybe at the same dealership.) Hey, isn't that kind of lumpy, a bit glue-footed for today's situation?"

Then I'd say: "What would be wrong with a joint venture in which the three major farm equipment manufacturers set up a joint venture they could call Dallas Ag Parts, or something. One warehouse, one tub full of type XYZ bearing, one guy picking parts, one truck delivering to the three (or maybe just one) dealerships."

For the record, I've never been able to get an argument going on this point.

"Hey," laughs a top parts executive for one of the majors, "you're trying to make socialists out of us!"

"Well," goes my snappy rejoinder, "you're pretty good socialists already. You share the same suppliers of components. Sometimes you share the same dealers. You have other manufacturers make some of your equipment line for you. Why not hang together on parts distribution?"

But even then, I was thinking in terms of just the farm equipment industry. As the fried chicken commercial used to say, "parts is parts." Whether a bearing is destined to go on a manure spreader, a commercial mower, a forklift or an auger, it doesn't make much difference while it's sitting in a tub in a warehouse. The cost and the efficiency of its delivery to the user means everything.

And so it seems practical for a parts distribution operation to spread itself across as many industries as could be practical.

In fact, some equipment makers have been dabbling in all-makes replacement parts programs for their dealers to pursue, mostly in the industrial and construction areas.

I'm suggesting this: If a bunch of investment bankers can form a parts aftermarket business that could shoot for maximum volume across the off-highway spectrum and make good money doing it, why couldn't some of the companies already in segments of the business do it *together*?

Isn't the alternative for the farm equipment companies and the outdoor power companies and the forklift companies to continue with their own go-it-alone, duplicate-it-yourself efforts?

If the original equipment makers don't want to do *something* like that in concert, will somebody please tell me: Where are they going to find the distributive efficiencies to be competitive in their parts marketing?

But how could somebody come along and organize all or a lot of

BILL FOGARTY

parts aftermarket players (manufacturers, parts jobbers, other involved competitors) into a sleek, competitive, profitable no-duplication marketer of off-highway parts?

Golly, don't look at me. You guys are the business big shots. I'm just a reformed English major/sports-writer/news reporter who's trying to cover this beat. But if somebody doesn't figure out how to do it, someone else with a big checkbook could come in and scoop up all the profitability of the parts business.

I recently asked some leading marketing executives of this business what they thought about some aspects of the parts battle.

Me: Do you think that the industry can stem the tide just by its manufacturers and dealers doing what they're doing now, only better and smarter?

One answer: "I'd like to say yes, but precedent is against us. We should look and learn from what happened to the auto makers' share of the parts market. We're in a very difficult struggle."

Another answer: "I'm not as gloomy about the situation as some are. I've seen some wising up among the majors. I think we can keep up with the new forms of competition, but we still have a big educating job with our dealers. A lot of them don't understand the right balance between price, margin and volume. Many won't go with the competitive price, and when a major says, 'You've got to merchandise this stuff,' they'll respond, 'You'd say that.'

"We companies haven't hired, trained, motivated and rewarded our own people to excel in parts careers. We haven't given them much direction, and we have to change this for the long term."

A third answer: "Can we staunch the flow? From my perspective, some of us are going to defend ourselves pretty well, because our dealers want to buy from us as much as possible. We think we can not only defend but regain, if we do the right things.

"We're telling our dealers they have to get more involved, and I think they're listening. We see results when a dealer believes what's happening.

"But some dealers don't. They are picking up parts business because other dealers have folded. They

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Farm Press Publications

INDUSTRY UPDATE

FIEI to Reorganize, Change Name: Equipment Manufacturers Institute

As of Nov. 1, the Farm & Industrial Equipment Institute will reorganize itself and change its name to the *Equipment Manufacturers Institute*.

EMI, said Emmett Barker, president, will provide national and worldwide trade association services for manufacturers of farm, industrial and construction equipment.

The FIEI board voted unanimously to make the change at an Aug. 8 meeting in Boston, Mass.

Barker said the organizational structure will place emphasis on function and product councils. Included will be a statistics council, technical council and a parts and service council. Initially, there will be 19 product councils.

Membership will be open to business firms throughout the world, Barker said. Active members will be those firms making agricultural, construction, forestry, materials handling and utility equipment.

Companies supplying related products and services will qualify for associate membership. Dues will be based on North American sales.

EMI will be governed by a 30-plus-person board, of which 10 will always represent the 10 largest dues-payers. Twenty will be elected by the membership, as will a chairman, vice chairman and second vice chairman.

Product councils will elect their own officers. Chairmen of the function councils will be appointed by the EMI chairman.

Headquarters will remain at 410 N. Michigan Ave., Chicago, Ill. 60611.

Frederick, 81, Dies; Past NAEDA Manager

Charles R. Frederick, 81, former executive vice president of the North American Equipment Dealers Assn., died Aug. 8 at St. Joseph's hospital, Kirkwood, Mo., after a stroke and heart attack.

Frederick joined NAEDA (then National Retail Farm Equipment Assn., later National Farm & Power Equipment Dealers Assn.) in 1957 and was its executive vice president from 1960 until retirement in 1973. He is survived by his wife, Nellie Lee Frederick, a son and a daughter.

July Retail Sales Surged In All But One Category

Retail sales of farm equipment were strong in July, according to the monthly flash report of the Farm & Industrial Equipment Institute. Only sales of over-140-hp, two-wheel-drive tractors showed a decline. which may have been a factor of inventory. Even tractors under 40 hp, which had been in decline for most of 1989, showed a solid gain. Biggest gainers of all were self-propelled combines.

UNIT RETAIL SALES

	July			January-July		
Equipment	1989	1988	% Change	1989	1988	% Change
Farm Wheel Tractors:						
2-Wheel Drive						
Under 40 HP	4,475	4,126	8.5	30,483	36,179	-15.7
40 & Under 100 HP	2,956	2,555	15.7	21,754	20,305	7.1
100 & Under 140 HP	257	201	27.9	2,978	2,529	17.8
140 HP & Over	629	781	-19.5	8,098	6,142	31.8
Total 2-Wheel Drive	**8,317**	**7,663**	**8.5**	**63,313**	**65,155**	**-2.8**
4-Wheel Driver						
Under 200 HP	80	38	110.5	682	555	22.9
200 HP & Over	158	64	146.9	1,643	954	72.2
Total 4-Wheel Drive	**238**	**102**	**133.3**	**2,325**	**1,509**	**54.1**
Total Farm Wheel Tractors	**8,555**	**7,765**	**10.2**	**65,638**	**66,664**	**-1.5**
Combines (Self-Propelled)	852	371	129.6	2,447	2,288	6.9
Rectangular Balers	1,350	817	65.2	3,430	3,154	8.8
Forage Harvesters (Shear Bar Type)	327	166	97.0	1,020	978	4.3
Mower Conditioners	2,116	1,018	107.9	7,372	6,569	12.2

BRIEFLY...

Fiat Geotech SpA is the new name for the group formed by the merger of Fiat Trattori, Pietro Laverdo and Fiatallis Europe in 1988. Sales in 1988 were $2.1 billion, an increase of $200 million over 1987. Fiat claims leadership of the European tractor market with 17 percent.

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Circle (3) on Reply Card

MARKETING NOTES

Japanese Eye Their Own Tractor Industry

Americans and Canadians can get a good, but incomplete, look at what's happening to sales of under-40-hp tractors by checking the monthly reports of the FIEI and CFIEI. Both show sales of this grouping of tractors, almost all of which are made in Japan, to be in decline currently.

The *Japan Economic Journal* provides a broader picture. In a recent article, it stated that in 1988, tractor shipments totaled 164,756, a decline of 8.5 percent from 1987. It was the second consecutive year-to-year decline.

Kubota, according to the article, had sales of more than double its nearest competitor, Yanmar. Here's how *Japan Economic Journal* divides up the combined domestic and export markets for Japanese-built tractors:

Company	Share of Market (Pct.)	Unit Sales
Kubota	42.2	69,527
Yanmar	19.8	32,592
Iseki	13.4	22,077
Shibaura	11.5	18,947
Mitsubishi	8.2	13,510
Others	4.9	8,073

Kubota is said to have 2,300 outlets in Japan with 12,000 salesmen.

The current market decline in Japan is blamed on that nation's "rice production adjustment policy and the liberalization of farm imports." Export declines are attributed to a strong yen, which tends to raise prices of the tractors in other nations.

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Ag Mall Concept Helped Stebbins Dealership Make It

Back in 1976, when it seemed that agriculture and its support industries were in for long-term growth with only minor hitches, what did many dealers do? They expanded their facilities, with the encouragement of their suppliers, realtors, builders and sometimes farmers.

Where are these dealers today? Many of them had to fold, swallowed up by the heavy overhead, and some of these businesses had served their farm communities for decades and generations.

Stebbins Implement Co. of Gothenburg, Neb., might easily have been among the casualties, for they took the plunge in 1976 and put up a 22,000-sq.-ft. dealership. The fourth-generation IH dealership, looking hopefully toward the future, had a volume that year of $3.5 million.

By 1983, sales had declined to $1.2 million. Nonetheless, the business founded by W.M. Stebbins and now managed by his great-grandson, Matt Stebbins, managed to hang on; this year, they celebrated their 100th anniversary.

"It has been a struggle," observes Matt today, "but we got a terrific education out of it, and we figured out how to survive and even make a profit."

Here's something that contributed a lot to survival: the Ag Mall.

"We were using only 55 percent of the building," he says. "We wanted to lower our overhead, so we founded the Ag Mall with the idea of getting tenants who could benefit themselves and us by being located here."

First tenant was Bill Peterson, who operates Gothenburg Market Center, a used machinery trading operation. Peterson had been in business elsewhere in Gothenburg since 1978, but his old location was lost to a city construction project. Today, he has offices in the Stebbins building and uses some of the dealership's seven acres to keep his inventory.

Stebbins cites some of the mutual advantages:

"Bill has to be gone a lot. We can take messages for him, take care of his walk-in customers. Sometimes, on certain types of unfamiliar equipment involved in trades, he can value them for us when our salesmen aren't sure about them. He can also write us a check for a used machine taken in trade, if that's what we want.

"Most of Bill's machines go as-is, but when he needs something reconditioned, we can do it. And when we have our spring and fall auctions, Bill helps us. He has a wide range of contacts over a number of states, and these help draw business here."

Another tenant is Harlan Tryon, who operates Tryon Welding in the Stebbins building.

"He's very good at fabricating a part for us and doing similar work that we may need from time to time. He also draws farmer traffic here."

Gandy Co., the Minnesota-based

(See MARKETING, pg. 39)

MARKETING NOTES

Bearing Supplies Stay Tight; Just Ask Hydreco

If you had expected the tight bearings situation to have let up by now, you're probably already disappointed. Or you may be disappointed without realizing that bearing supplies are contributing to delivery delays in some cases.

Hydreco, Augusta, Ga., makes hydraulic gear pumps, which take roller bearings. The reduced supply of such bearings has severely constrained the production and delivery of Hydreco's 2000, 2400 and 2900 gear pumps.

In a letter to customers, Stan Sokolowski, marketing vice president of Hydreco, said: ''The reduction is attributable to the class-action suit brought forth by a major domestic bearing manufacturer against foreign manufacturers and the practice of dumping.

''We have, with no success, queried available sources not only in the U.S. but in Japan, Europe and Brazil as well. Even though we have been successful in reducing the procurement lead time by several weeks, shipments for July and most of August will be delayed.

''Our search included an examination of possible substitutes. This proved fruitless. Available substitutes did not meet design criteria and compromised product quality. The rollers in our bearings are designed to match the shaft under load. This is the heart of the gear pump and is the basis of its operating performance and reliability.... We pledge our continued efforts to the full resolution of this condition and welcome any suggestions our customers have.''

Asked about the situation in mid-August, Sokolowski said that the type of bearing his company needs remains in tight supply. ''We've obtained some here and there, sourcing in Europe through an affiliate company, but we're still in a delivery bind.''

5-Year Margin Review: No Wonder Dealers Ticked

Slender margins, even as sales improve, were the subject of wide discussion at the NAEDA convention in Boston. (Related article starts on front page.) Here's a five-year review of what NAEDA Cost of Doing Business studies indicate on the matter. Average sales are shown in millions, average margins as a percentage.

Year	Sales, New, Used Equip.	Gross Margins
1984	$1.547	6.56
1985	1.424	6.83
1986	1.446	7.09
1987	1.524	7.77
1988	1.776	8.04

The mid-1980s were among the worst years the North American farm equipment industry has experienced. According to the NAEDA study, combined new and used margins were at their lowest in 1984 and sales volume at its worst in 1985, when industry inventories of new and used machines were highest.

By way of contrast, gross margins in 1979, a record year for the industry, were 9.86 percent on an average dealer new and used equipment sales volume of $1.759 million.

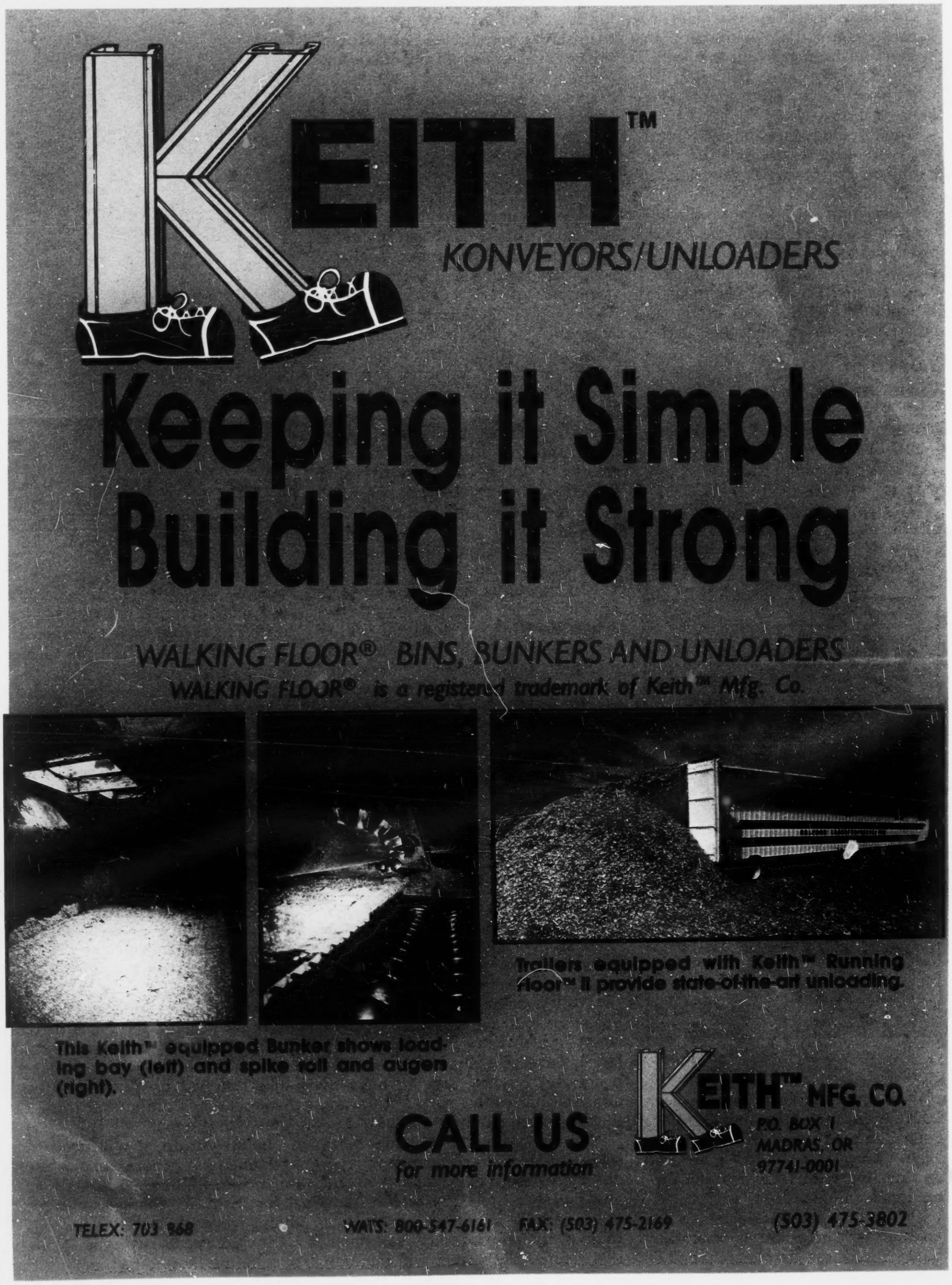
Clearly, improvement in gross margins, from which dealers must pay salaries, expenses and overhead in order to make a profit, is not taking place.

Briefly...

H. G. (Mac) McCarty, executive vice president, Ford New Holland, retired Aug. 1. He had been president of Sperry New Holland and New Holland, Inc., for over 10 years and joined Sperry New Holland in 1951 as an engineer trainee. In 1973, he became vice president of engineering; a year later, he was North America general manager.

Jerome Increase Case, founder of J I Case Co., will be inducted into the Agricultural Hall of Fame, Bonner Springs, Kan., Oct. 20. The induction will be followed by two days of demonstrations of antique Case tractors and equipment. Hall of Fame telephone: 913/721-1075.

Kubota Tractor Corp. has named Robert Lowell as regional sales manager and Ron Crouse as director and manager of its Northern Div. at Columbus, Ohio. David Chapman is the division's new consumer products dealer development manager.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